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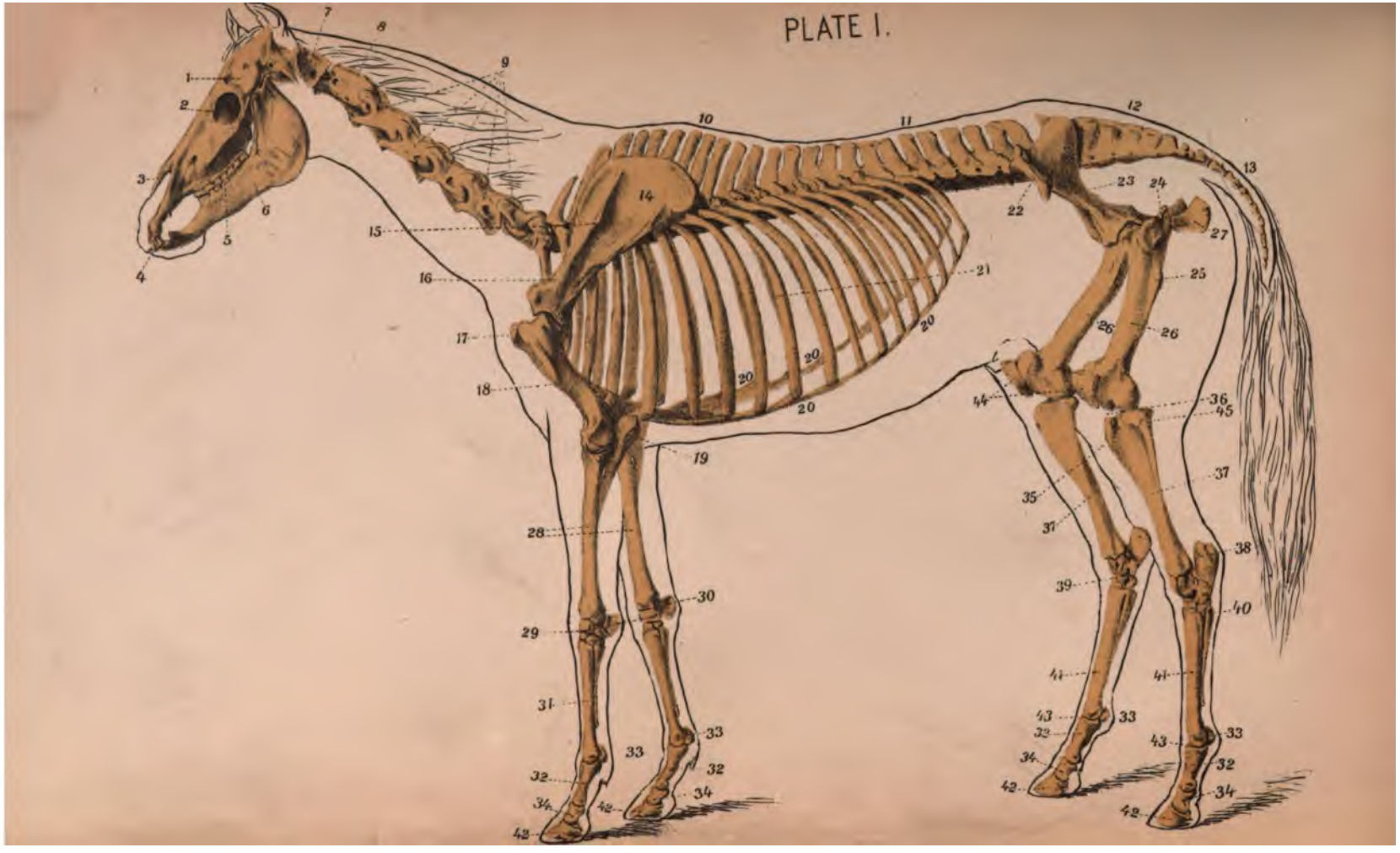
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VETERINARY

MEDICINE AND SURGERY

IN

DISEASES AND INJURIES

LANE LIBRARY

OF THE

HORSE

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COMPILED FROM STANDARD AND MODERN AUTHORITIES AND EDITED BY

F. O. KIRBY.

Illustrated by Four Colored Plates and One Hundred and Sixty-eight Wood Engravings

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172
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1883

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PREFACE.

THIS work has been prepared with a desire to present in a concise form a practical manual of the diseases and injuries of the horse, and their treatment, for the use of practitioners of medicine and other intelligent horse owners. The professional veterinarian already has at his command several large and excellent treatises. These, however, devote considerable space to the consideration of subjects familiar to the student of medicine, and unnecessary to the non-professional reader. Physiology and pathology are, therefore, seldom referred to in the present work.

Originality is not claimed for this hand-book, although many practical ideas, the result of sixteen years' experience in the ownership and consequent care of horses have been incorporated in its pages. It would have been a more agreeable task to rewrite it entirely, but the time requisite for such an undertaking was not available, and it has been necessary to make free use of the work of others.

The recent treatise of General Fitzwygram on Horses and Stables has been taken as a basis, and quoted from verbatim to a large extent. Similar copious extracts have been made from the works of Prof. Williams on Veterinary Medicine and Surgery, and from the still later treatise on Equine Medicine by Prof. Wm. Robinson.

The editor desires to acknowledge his indebtedness also to the works of Percivall, Gamgee, Hayes, Youatt, Mayhew, Dun, Walsh, Blain, Tuson, Armitage and others, to the *Veterinary Journal*, to D'Arboval's Dictionnaire de Médecine Veterinaire, etc., all of which have been freely drawn from, especially for methods of treatment.

The compiler is conscious that there are many imperfections in his work, but believes, nevertheless, that it will be found better fitted for the purpose for which it has been prepared than any heretofore published.

NEW YORK, November 1st, 1883.

EXPLANATION OF PLATE I.

SKELETON OF THE HORSE.

☞ This figure is drawn from the skeleton of the famous race horse Eclipse, and is considered by Professors Gamgee and Law, from whose work on veterinary anatomy it is copied, as anatomically perfect.

1. Zygomatic arch.
2. Orbital cavity.
3. Face bones.
4. Incisor teeth.
5. Molar teeth.
6. Lower jaw.
7. Atlas, 1st vertebra of neck.
8. Axis, 2d vertebra of neck.
9. Cervical vertebræ (5).
10. Spinal processes of back.
11. Dorsal and lumbar vertebræ.
12. Sacrum.
13. Coccygeal or tail bones.
14. Scapula, or shoulder blade.
15. Acromion process.
16. Hollow of shoulder blade.
17. Superior tuberosity of the humerus.
18. Humerus, or arm bone.
19. Olecranon, or elbow bone.
20. Cartilages of the ribs.
21. Ribs.
22. Haunch, the external and anterior angle of the ilium.
23. Os innominatum, or Haunch bone.
24. Great trochanter.
25. Small trochanter.
26. Femur, or thigh bone.
27. Ischium, posterior angle of the ilium.
28. Radius, or fore-arm bone.
29. Carpal or knee bones.
30. Trapezium.
31. Metacarpal, or Cannon bone.
32. Os suffraginis, or pastern bone.
33. Sesamoid bone.
34. Os coronæ, or small pastern bone.
35. Superior tuberosity of the tibia.
36. Stifle joint.
37. Tibia, or leg bone.
38. Os calcis, or point of hock.
39. Tarsus, or Hock joint.
40. Head of small metatarsal bone.
41. Cannon, or metatarsal bone.
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NURSING.

Whilst there is no real difficulty in giving medicines to most horses, and in carrying out the directions to be found in treatises on veterinary medicine, there is nevertheless a knack in many of the practical operations which is only to be acquired by experience—so that no one should be discouraged by his awkwardness at first, but bear in mind that gentleness, firmness, and patience will enable the operator to accomplish his purpose easily with all but the most high-strung and vicious animals. Horses vary greatly in disposition; some can be manipulated in almost any manner without the slightest resistance, others resist any unaccustomed handling, and some require the experience and skill of the professed veterinarian for medical or surgical treatment.

The first requisite for a sick horse is pure fresh air, avoiding always draughts from any direction. If much sick, a loose box, as it is called, is very essential, as it allows the animal more room to move about and assume whatever position is most restful to him.

A Loose Box should not be less than ten feet square and should have a low half door, over which the sick horse can droop his head if so inclined. The box should be in a quiet part of the stable, removed if pos-

sible from the other horses, and so situated as to the windows that it can be darkened, if desired, for horses with disorders of the nervous system and eye troubles. The floor should be liberally covered with fresh clean straw, or saw dust; keep the floor of the box clean, but do not wash it while in use. A loose box used for sick animals should be frequently and thoroughly whitewashed.

Blankets and other clothing upon sick horses should be loosely fastened on; if a surcingle is used, let it be quite slack. Shake and air the clothing once or twice a day, but do not let the horse stand uncovered for any length of time, nor at all unless he is likely to be benefited by it.

A seriously sick horse should have all his shoes removed, as it will give him comfort and ease.

Fresh Water should be constantly within reach; especially when fever is present, the horse will frequently sip at it.

Hard water, which contains an excess of saline and mineral substances, does not as a general rule agree as well with horses as soft water, such as that obtained from a river or pond. It is apt to produce irritation of the bowels and, as a secondary effect, a staring coat.

The salts contained in hard water may be in a great degree precipitated by boiling, and most waters become softer by being exposed to the air.

Any sudden change in the kind of water supplied to horses is apt to cause derangement and even irritation of the mucous membranes of the bowels, especially a change from soft to hard water. Hence if the water is very hard, it should be boiled before being given to valuable horses, particularly if they are not accustomed to it.

Rain or other soft water stored in tanks soon becomes full of decomposing vegetable matter in hot weather.

To horses predisposed to scour, water should be given frequently and in reduced quantities, and in winter the chill should be taken off by mixing it with a very little warm water. Perhaps the best plan is to leave water always before such horses, because when so supplied they drink less than when watered at intervals. A diminished quantity of water taken into the system, by lessening the secretions of the intestines, decreases the tendency to purgation.

If reduction of the quantity of water does not produce the desired effect, it may be mixed with a little wheat flour, which has a slight astringent effect on the bowels. If further measures are needed, boiled

linseed or some such demulcent should be mixed with the oats; and it is as well to bruise the oats, because their ends are liable to cause irritation on an over-sensitive intestinal lining. Horses disposed to scour should be stinted of their water before going to work. Some horses will scour unless a little hay is given to them in the morning before they are watered.

The sense of smell, always acute in horses, is greatly increased in most diseases. Medicines which have strong smells cannot therefore be commonly administered in drinking water or mashes. Most horses will refuse them.

The **Appetite** of a sick horse is often very capricious, and during the height of a fever is generally entirely lost. It is of no use to try to force it to eat; place a variety of food before it and in small quantities at a time, always removing whatever is left, before placing another portion before it. This should be particularly seen to in the case of mashes or wetted food of any kind, which is sure to become sour and offensive, even to a well horse.

Delicate Feeders.—Both care and skill are needed in regulating the diet and tempting the appetite of delicate feeders. Some will reject their food altogether, if it is given them in large quantities; whilst they will eat it, if only a small quantity is offered at a time. Others again will not feed, unless they are allowed frequently to moisten their mouths with water, whilst eating. Water should be kept constantly before such animals. Others again, apparently of a nervous or timid disposition, will not feed, unless there is a spare stall between them and the next horse. Many horses feed very slowly, and are consequently robbed, when possible, of half their food by their more voracious neighbors. A little linseed boiled to a jelly and mixed with the oats will induce others to eat more freely. Hay slightly damped and sprinkled with salt is palatable to some horses, who will reject it when dry. A pretty frequent change of food is acceptable to some delicate feeders. A little wet bran with the oats is grateful for a time to some horses. Some horses seem to tire of oats and will take half a day to eat four quarts; such will often relish and consume at once the same quantity of fine feed. For others carrots or green foliage may be substituted for hay.

Tonics no doubt increase the appetite, but should be administered always with discretion.

Mashes are exceedingly useful in feeding sick horses, but they should

always be quite moderate in quantity, and carefully prepared. The pail in which it is made is the best to feed it from, for if poured into the manger, it will sour and contaminate everything afterwards placed in the same receptacle.

To prepare a bran mash, place two quarts good bran into a pail, and pour *boiling* water over it, mix thoroughly with a stick, and let it stand until cool enough to use.

Bread mash is made by soaking a loaf of bread, broken up, in fresh milk until it is thoroughly saturated, and can be reduced to a pulp; add a little salt.

Linseed mash is made by boiling a half pound of flaxseed (not ground) in two quarts of water until it is reduced to about three pints. Pour this over bran instead of water and mix.

Mangers.—A horse with a free discharge from the nostrils should, as a general rule, be fed from a temporary manger or bucket placed near the ground, as the depending position of the head, whilst the animal is feeding, will facilitate the discharge. A wheelbarrow will serve very well, as a make-shift for this purpose. But where the patient shows signs of headache, as is often the case especially in feverish attacks, this position, which would determine more blood to the head, is very undesirable. Steaming the head is very beneficial in catarrhal affections.

When a horse has a discharge of a suspicious character as to its nature, he should be tied up sufficiently to prevent his throwing it about all parts of the walls of the box.

Hand-rubbing of the LEGS is very useful in relieving any little fulness arising from over-work or in other cases from the absence of proper exercise. The pressure and friction thereby given excites the blood-vessels and absorbents to increased action.

A good bed is essential to comfort. Fresh clean straw certainly looks nicest, and has undoubtedly the advantages of cleanliness and sweetness; but many practical men prefer a bed made of *old* straw litter collected, but of course carefully cleaned and dried. It makes a softer, firmer, and more substantial bed; while on the other hand the long hard ends of the new straws, especially wheat, are apt to irritate and annoy a weakly and sensitive patient.

Fomentations, to be really useful, should be continued for at least one or two hours at a time. The temperature of the water should not exceed 106°, or hardly as hot as the hand can comfortably bear. The

temperature must be kept up to this point by the frequent addition of small quantities of hot water. The sponge or swab should not be allowed to touch the parts affected, but should be applied higher up, so that the water only may trickle down over the inflamed or injured surface, Fig. 1. When the fomentation is discontinued, the parts should be loosely covered with flannel in order to obviate the risk of a chill. If flannel is not available, or the part is so situated that it cannot be conveniently ap-



Fig. 1.

Fomenting a wounded leg.

plied, ammonia liniment, in cases where there is no abrasion of the skin, may be lightly rubbed on.

When servants cannot be spared for the tedious work of fomenting, a fair substitute will be found in wrapping the part round with thick wollen stuff covered with rubber cloth, which will long retain both heat and moisture.

The leg below the knee may be conveniently fomented by putting it in a deep bucket of warm water. In all large establishments it is well worth while to get a bucket made half as deep again as usual for this especial purpose, Fig. 2. The water in such cases may require to be put in after the horse's leg is in the bucket.

In most cases three or four fomentations in the course of the twenty-four hours are sufficient.

Cold-water Bathing of the Legs is in many cases very beneficial. The cold gives tone to and braces up the structures, which may have become weak or deficient in vital energy. The value of cold as a tonic has not been sufficiently appreciated in such cases.

A very convenient india-rubber apparatus is made for the purpose of bringing a constant stream or trickling of cold water on any part which may require such treatment.



FIG. 2.

Tub for soaking the foot and lower leg in warm water.

After each application the part should be thoroughly dried and wrapped in a cotton bandage. The cold application under ordinary circumstances may be repeated three times, but not oftener, during the day.

Gentle **Hand-rubbing of the Skin** and also sponging of the nostrils and dock with weak vinegar and water are generally refreshing to sick animals.

The sheath should always be carefully cleaned at the outset of any serious illness, and this operation should be repeated, if the case is prolonged.

Giving a Ball requires for its successful performance a knack which may be learned by carefully observing Gamgee's directions, as follows, viz.:—1stly, Turn the horse from his manger, with a halter on, held by a groom or assistant. Attempting to give a ball to a horse tied up in a stall has before this proved a fatal experiment to the operator. 2dly, It is extremely dangerous to resort to twitching with awkward horses, as our power in keeping the mouth open depends on the moderate stretch on the tongue, which is not felt or cared for by a horse severely punished with a twitch on his ear. 3dly, Stand on the off side of the horse's head, with a towel in the left hand to wipe the mouth, should there be, as in some cases, an excessive amount of secretion to interfere with holding the tongue; the left hand is placed on the horse's crest, whilst the right is introduced into the angle of the mouth, the tongue is seized gently, wiped if necessary, grasped with the left hand as in Fig. 3, and drawn downwards. Some persons introduce the left hand so as to compress the tongue against the left side of the lower jaw, bringing it between the molar teeth on that side; and others drag the tongue out of

the mouth, and hold it firmly. It is extremely important to hold it so that, in any movement the horse may make, there is a point of support for the hand against the lower jaw. Pulling on the



FIG. 3.

Method of holding tongue in giving a ball.

tongue may give unnecessary pain, make a horse restless, and in tossing his head about, the organ may be severely lacerated. 4thly, The ball,



FIG. 4.

Showing correct way of holding a ball.

which has been ready all the time in the assistant's hands, or in the waistcoat-pocket, or grasped by the lips of the operator, is seized as in

Fig. 4, and, avoiding unnecessary bustle and hurry, it is carried up the middle of the mouth and dropped on the back of the tongue; at the same instant the tongue is quietly let loose, and as the horse draws it back, the ball is engaged in the pharynx, whence it cannot return unless by a fit of coughing; as soon as the hands are withdrawn, the mouth is kept closed, and the left side of the neck watched to see the ball pass down the œsophagus; this may occur before looking round to the neck, so that, after waiting a little, if the ball be not seen, the horse should be caused to drink a little water. The practice of giving a little water to drink after giving a ball should always be adhered to, as it is disagreeable to leave an animal, and when the operator's back is turned, the ball be coughed into the manger; moreover, in morbid conditions of the system, and in the unnatural manner in which the bolus is swallowed, the passages are not well lubricated, and the ball may be some time before it penetrates the cardiac orifice.

With vicious horses, horses with narrow mouths, and in cases of trismus, when balls are to be given, instruments should be used. Balling irons, to prevent the closure of the mouth, have been constructed of various kinds; the simplest, represented by Fig. 5, is made of malleable



Fig. 5.
Usual form of balling iron.

iron, and is adapted to the average size of a horse's mouth. Other and more perfect forms are represented by Fig. 6 and Fig. 7. Perhaps the most useful is Mr. Varnell's improved balling iron, which may prove serviceable in cases where with difficulty a horse is made to open his mouth as wide as it is desirable, and if, instead of giving balls, the teeth and other parts of the mouth have to be examined and operated on. These can be had of a surgical instrument-maker in any large city.

The usual and old-time method of making a ball is to mix up the

ingredients with a little honey or molasses to form a stiff dough, adding, if necessary, sufficient linseed meal or bran to give it the proper size,



FIG. 6.
French balling iron.



FIG. 7.
Varnell's balling iron.

which is commonly about that of a man's thumb. The gelatine capsules, now to be had in most drug stores, are, however, much nicer in every



FIG. 8.
Gelatine capules for veterinary use.

way, and those having many horses to care for would do well to keep a supply of them on hand, Fig. 8.

To give a Drench, it is preferable to have the horn made specially

for the purpose (Fig. 9); but in its absence a soda-water bottle will answer fairly well. Gamgee's rules are:—1stly, Hold the horse's head up



FIG. 9.
A drenching horn.

at a moderate height, so that the line of the face is horizontal. 2dly, Secure the tongue to prevent the lapping out of the liquid, but allow of sufficient movement of lips, tongue, cheeks, and jaws, so as not to interfere with the first act of swallowing. To draw the tongue forcibly outwards is very injudicious, as if the tongue be stretched it does not aid in pressing back the fluid, which gravitates as the tongue is pulled upon,



FIG. 10.
Gamgee's method of holding a horse's head, to give a drench.

and the larynx and pharynx advance;—the animal may thus be choked. 3dly, If an animal makes an effort to cough, rather lose the draught than risk the danger of suffocation, which so readily occurs if fluid be suddenly thrown over the tongue. 4thly, Entice efforts of deglutition,

should the horse obstinately and artfully retain the liquid in his mouth, This is effected by manipulating the throat, and exerting pressure in the intermaxillary space.

The methods of holding horses during the exhibition of a draught are various, but the most important ones are three. In the first place, by ropes and pulleys a horse's head is pulled up from a beam or other high object in a stable or shed. This is very objectionable, especially in a vicious horse; and we have never found it to answer better than the second manner of introducing a rope-noose over the upper jaw. This noose is attached to a stick; or slipped over a stable-fork prong, Fig. 10; and a man can then hold up the head of the heaviest horse and follow him in his movements. It requires management. I do not like the fork, as it is a dangerous instrument, and prefer an ordinary twitch. In Fig. 11, the third manner of holding a horse's head up and exhibiting a



FIG. 11.
Another method for giving a drench.

drench is represented. It is the most simple and useful method. It only requires one person, who holds the tongue, places his thumb round the lower jaw, and with his fingers causes the horse to open his mouth whilst the draught is poured out of the horn with the right hand.

Appliations to the Schneiderian membrane can best be made by the use of Rey's tube, Fig. 12.



Fig. 12.
Rey's tube.

The long arm of the tube is fifteen inches in length, and one and a half inches in diameter, expanding and funnel-shaped above, where the broadest part is two inches wide. The short arm is five inches in length, and the aperture two-thirds of an inch in diameter. Over the short arm is passed a closely-fitting leather ring, four and a half inches in diameter. This serves as the surface over which, and round the short arm, wet tow may be adapted, so that, on introducing the small tube in the nostril, the latter is compressed carefully on to the tow; at the same time fluid is poured into the funnel, and rises in the nasal chamber. If the horse's head be bent in and held as much as possible in a perpendicular position, the lotion will pass out at the opposite nostril. There is sometimes a litle difficulty in performing this operation with awkward horses, but by quiet means they may be accustomed to the operation. Some persons advocate twitching; occasionally the ear may be twitched; the animals sometimes require to be blindfolded, but at others it is best to let them see what is being done; and most frequently not the slightest trouble attends the injection. It is an invaluable method of using remedies in the treatment of diseases of the nose.

Injections.—A number of instruments have been constructed with a view to force fluids into the intestines of man and animals. The false notion has been acted on, that enema syringes or pumps are valuable in proportion to the force with which they will propel liquids into the intestinal tube. It has been said, that by that means you overcome obstructions, and may even under other circumstances carry nutritive fluids into the cæcum, where they will be absorbed.

The best instrument to use for enemas in the horse is Gamgee's funnel, Fig. 13. It consists of a straight metallic tube twelve inches long, tapered and rounded off at one end, bent at a right angle at the opposite extremity, which supports a broad funnel about six inches deep, and seven in its greatest diameter. The funnel need not be so large. In using this instrument, its extremity requires to be oiled before introduction into the rectum; so soon as this is effected, the fluid—water, with a little oil, is

preferable—is poured into the funnel. Experience proves that no pumping force is required to inject fluid into the intestines, the effect of gravitation fulfilling the same purpose in a much more simple manner. As the fluid from the funnel gravitates into the rectum, bubbles of gas escape; the action of the gut, thus mildly stimulated, continues until, with the repetition of the process at intervals of a quarter of an hour, the required evacuation is induced, with its attendant relief. Farmers and others who keep a number of horses should obtain an instrument like the one described: made of tin, it is light, cheap, and very durable.

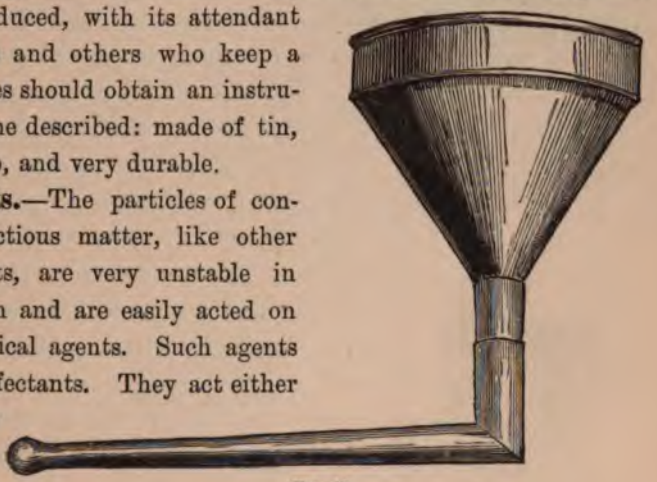


FIG. 13.
Gamgee's funnel for injections.

Disinfectants.—The particles of contagious or infectious matter, like other organic ferments, are very unstable in their composition and are easily acted on by various chemical agents. Such agents are called Disinfectants. They act either by poisoning or killing the ferment; or by abstracting the hydrogen from noxious gases and vapors, break them up. Chlorine gas, carbolic acid, and many other compounds are commonly used for these purposes.

True disinfectants act chemically by decomposing noxious gases and organic matters. Such are chlorine and its compounds, sulphurous acid, Condy's fluid, chloride of lime and soda, carbolic acid, etc. Their action is produced by their affinity for hydrogen, which is a constituent of most of the deleterious matters found in the stable. They appropriate to themselves this constituent, and by this means break up the poison. Most disinfectants are also deodorizers.

Deodorizers generally, as distinguished from disinfectants, act mechanically. They have an affinity for certain compounds floating in the air, and imbibe and absorb them. Such are sawdust, powdered charcoal, plaster of Paris, sulphate of iron, clean dry earth, sand, permanganate of potassa. Deodorizers may, under some circumstances, become so overcharged with noxious matters that they may of themselves voluntarily give them off. Earth, for instance, which is a most valuable

deodorizer, may become so loaded with impurities as to become stinking Similarly, disinfectants can only combine with a certain proportion of noxious gases or organic matters, and then become inert and valueless.

Disinfectants, however, and deodorizers, whose action is somewhat similar, though very valuable assistants, should never be allowed to take the place of free ventilation. It is true that they have, as explained above, a very beneficial effect in killing or breaking up the poisonous particles; but they are not sufficient thoroughly to purify the air. Free ventilation, or, in other words, a real and actual change of the air, whether in the stable or in the sick chamber, is absolutely necessary.

Together with plenty of fresh air and due regard to cleanliness, disinfectants and deodorizers are useful means of purifying the air of stables, and also in neutralizing those noxious emanations given off from the bodies and breath of diseased animals, which, if undiluted or undestroyed, may become fruitful sources of diseases. It must never, however, be supposed that they supersede or even diminish the necessity for adequate ventilation and scrupulous cleanliness.



FIG. 14.
Nosebag for steaming the respiratory passages.

It is a well ascertained fact that in hospitals, where much reliance has been placed on the use of disinfectants, disease has often spread with greater rapidity and virulence than in buildings where no such agents have been used, and where, in consequence, thorough ventilation has been more carefully attended to.

Steaming may be most efficiently performed by use of the bronchitis kettle specially made for the purpose, but as few are likely to have sufficient use for it to warrant its purchase, recourse may be had to the nose-bag, Fig. 14. Any old grain bag will answer, provided it is clean. Make some ragged holes in the bottom and about the lower part of the bag; into this place some clean hay, and pour a couple of quarts of *boiling* water upon it, and as soon as the hay is saturated, tie the bag over the animal's nose. This operation should be repeated as often as the vapor ceases to rise, for at least an hour at a time.

Poultices, though very convenient in the human subject, are not

equally applicable in the horse, because they are not easily fixed, except on the feet. A poultice, unless made large, dries too rapidly, and is then apt to cause irritation, instead of soothing. On the other hand, if made large, it is heavy and difficult to secure. The poultice must not be tied so tight as to arrest the circulation or to leave a mark. With this view, a broad tape or a piece of list should be used instead of a string. An old stocking with part of the foot cut off makes a good poultice bag for the lower part of the leg.

Poultices should always be inclosed in a bag made from some thin but strong material, in order to prevent the substances from which they are made from becoming entangled with hair, making it very troublesome to clean. Fig. 15 also shows how they may be inclosed. They should



FIG. 15.
Enclosure for poultices.

be snugly fastened by bandages, as just stated, to the diseased part, and removed as often as necessary to keep them sweet. Applications of various liniments, irritants, disinfectants, anodynes, etc., may be made by mixing with the substance of the poultice, or spreading upon its surface.

Poultices intended for the special purpose of giving warmth to a part are usually made of hot bran. Those intended for relaxation may be made of equal parts of moist bran, linseed meal, and olive oil; or of boiled carrots or turnips mixed with bran. For ill-conditioned sores linseed answers best. If a sore is painful, opium may be added to any of the above. To soften the horn in inflammation of the feet, vinegar may be added to the bran. A poultice may be made an astringent dressing by the addition of sulphate of zinc.

Powders, if tasteless, may be given sprinkled on the food, or mixed with molasses as electuaries, or of any kind, nauseous or otherwise, in a

ball. It is not at all necessary that a ball should be always large or of a fixed size; indeed, the smaller the better, if it can be as surely administered.

Electuaries are easily given by rubbing on the tongue or the teeth, from whence they are at once licked and swallowed with the saliva.

Medicines of which but a very small quantity is administered at a time, may be dropped or poured upon the tongue.

In applying **Blisters,** the affected part should have the hair closely clipped or shaven off. If properly applied and watched, blisters should not leave any permanent mark or scar. If a blister appears to be too severe, it should be removed, the vesicant washed off, and olive oil freely rubbed over the part. Never remove the loose cuticle raised by a blister until it begins to peel off naturally. If the horse shows any disposition to gnaw at the blister, his head should be tied up so that he cannot reach

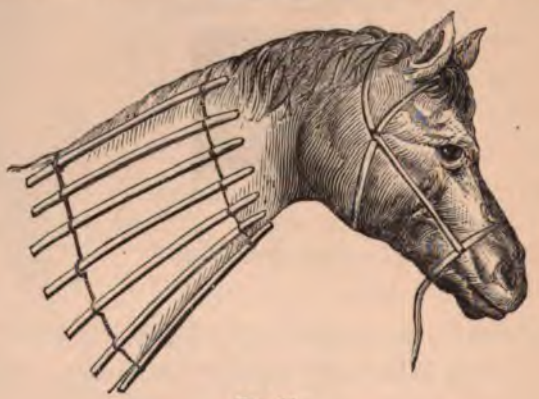


FIG. 16.

Cradle to prevent biting at a wound.

it, or a cradle put on his neck. Fig. 16. This may readily be made by any one with some smooth light sticks and stout twine.

BLISTERS, whether intended to produce simple irritation or redness or to actively inflame the deep tissue, are applied by rubbing or smearing upon the skin such agents as will produce the desired result. After sufficient action has been set up, further irritation may be arrested by gently washing off the substance used, and applying olive oil.

Bleeding is a most powerful and certain depressant and sedative. It lessens the action of the heart and lungs. It produces this effect mainly by diminishing the quantity of blood in circulation, and it also acts in some not very easily ascertainable way on the nervous system.

When it is thought necessary to employ it, blood enough should be taken to produce a marked alteration in the character of the pulse. The blood should be drawn in a full stream, so as to produce the effect as quickly as possible. If bleeding is resorted to at all, it should be in the very early stage of disease, before the strength fails.

Bleeding, however, is not a safe remedy. As a general rule it should be avoided; and if there is any doubt as to its advisability, it is always safer not to bleed. Far more horses are killed than saved by this remedy.

General blood-letting in horses is commonly performed by opening the jugular vein. For this purpose a fleam, Fig. 17, is preferable to a



FIG. 17.
Fleams for blood-letting.

lancet, for reasons that need not be discussed here. Five to seven quart is a full bleeding, and one such blood-letting from a strong and previously healthy horse is sufficient in nearly all cases. A recent writer on ailments of the horse gives the following detailed directions for bleeding, viz.:

"The instruments usually preferred are the fleam and blood-stick, on account of the certainty of tapping the vein to the proper extent, and thus making an opening with mechanical precision—neither too small nor too large. A less scientific substitute is the lancet, which in the eyes of some looks more 'elegant' and 'gentlemanly;' but the days of elegance at the expense of precision and certainty have gone by.

There are three important points to be observed in the operation. First, it is essential to bear in mind that the skin over the vein is very freely movable, and readily forms a valve at any time between tapping the vein and the final pinning up. Second, the use of a rusty instrument,

or one that has the least particle of refuse left after former use, will set up inflammation. Third, when pinning up, any dragging upon the skin will cause a thrombus: including the vein will cause inflammation: and tightening the figure of eight ligature over the pin too much will cause gangrene of the skin, inflammation, and suppuration, or a sloughing process.

No securing is required, but a snaffle bridle is to be preferred. Having brought the horse's neck, near or left side, to a good light, we take a a sponge freshly wrung out of water and smoothe the hair with it over the bleeding place. This should be the bottom of the upper third of the neck. Next we get an assistant to elevate the chin, and keep it elevated all the time. A tall assistant will rest the chin of a medium-sized horse on his shoulder, whilst a short assistant will find his head the best, with the hand or hands as a cushion. If the assistant cannot spare a hand to cover the eye next the bleeding side, a duster had better be used as a blinder. Now the operator should take the clean fleam, moistened with his saliva—not dipped in bad, rancid oil or lard, or anything which will inoculate—in his left hand, holding it between his forefinger and thumb, and make steady pressure, *without dragging upon the skin*, upon the vein with the remaining fingers of his left hand. He must be patient, and keep up a steady pressure thus—resting his right hand, which holds the blood-stick, upon the mane—for two or three minutes, or until the vein has risen and is quite ropy and tense. He now quietly lowers the fleam, and lays it along the vein in its central axis, and then *quietly* brings the stick forwards and gives the fleam a heavy blow, when there will be a spurt of blood. It is not essential, but it is far better, to keep the left hand quietly pressing upon the vein, and let the assistant or a third person hold the receptacle for catching the blood. A third person is best; then it allows the head to be kept elevated and steady, and allows the operator to keep up his steady pressure to the end.

Before commencing, it is a good plan to form a rough estimate of the capacity of the receptacle for the blood—usually a common stable pail; then we stop when six pints have been drawn for a large horse and a heavy bleeding, or when four, or even three pints, have been abstracted for a bleeding whose object is to relieve the right side of the heart—as in enteritis, etc., where we have a small, wiry, empty artery, and the blood at first flows black and 'treacly' in a thin stream. A good indication for stopping the bleeding and pinning up consists in a larger flow com-

mencing, of less dark color, etc. Of course, when the amateur is used to the feel of the pulse, he finds the artery grow larger and softer *at the time* the blood begins to flow freer and become better in color, and then he has the further assurance of the desired end being gained. Long, starving, wasting diseases generally, and some blood diseases, cause wiry, empty arteries; but where there have been no such causes at work, and the horse within a few days, or it may be hours—as in enteritis—comes to have a thin, wiry pulse, it is a sure and certain indication of a crowded overwhelmed right heart, which needs relieving, when the bleeding never fails to deliver the animal from such a disastrous combination. Even in human practice, where general bleeding has been so largely abandoned these forty years past, the above indication has always called forth the lancet with all reasonable practitioners.

The altered color is a sign for stopping in the above-named condition, then sighing is a sign for stopping under any circumstances; so is a dilated pupil, though sighing and a dilated pupil are usually present at the same time. We hardly need say that the less blood drawn, sufficient for our purpose, the better, and under no circumstances should a horse be bled beyond six or eight pints. If the hand be not used to press on the vein, but the edge of the receptacle be used, care has still to be taken lest we drag on the skin."

Pinning-up or arresting the flow of blood is the most important part of the operation. (For full directions see the section of this chapter on Sutures.)

The horse should always have his head tied up high, and thus steadied, for one or two hours after bleeding, when practicable. We ought never to forget that an opiate (tincture of opium as a draught, or mor-



Fig. 18.
Acupressure.

phia hypodermically) *in suitable cases* acts like a charm after general blood-letting; it is, in fact, the coffee after dinner of therapeutics.

If the blood is drawn from an artery, the operation is best performed by a lancet. In some cases of cerebral meningitis, the temporal artery

has been opened with good effect, and the wound in the skin closed by means of a pin, retained in its position by a small quantity of tow or thread. If the hæmorrhage is not arrested by this method in the case of arteriotomy, a pin or needle can be placed underneath the artery Fig. 18, as in acupressure. In this way it will be most effectually arrested, at the cost, however, of the vessel, which will become obliterated at that spot. But this is of little consequence, as the collateral circulation will be sufficient to maintain the integrity of the part.

Local blood-letting is performed upon the inflamed part, or as near to it as possible, and the object is speedily to unload the engorged blood-vessels. It may be done by scarification, incision, or puncture. In conjunctivitis, for example, it may be drawn from the vessels of the inflamed part by scarifying the inner surface of the eyelids, or by opening the angular vein. In inflammatory disease of the foot, any quantity can be obtained by puncturing the coronary plexus of veins.

When general blood-letting from the jugular is practised, the animal's



FIG. 19.



FIG. 20.

Two forms of seton needles

head should be elevated and a full stream of blood allowed to flow from a sufficiently large orifice in the vein. If this be done, a smaller amount of blood drawn will make a much greater impression on the pulse than when the orifice in the vein is small, the blood flowing in a trickling stream, and the head depressed.

Setons are usually introduced by means of needles made specially for the purpose, Figs. 19 and 20, although in some places a seton may

be run under the skin by cutting a channel with a long-bladed pen-knife, and pushing a stiff cord through. If the seton is to be inserted under the skin only, pinch it up and make a short cut, say half an inch, with a knife, then insert the needle and push it along just under the skin to where it is to come out. Feel for its point, and cut another slit through which bring out the needle. Whether cord or tape is used, see-saw it once or twice, knot it well at each end, after insertion, to prevent its drawing through. Some horses will allow this to be done without noticing it much; others should be blindfolded, and with still others a twitchup will be needed in addition.



Fig. 21.
A seton in position.

If the seton seems to cause itching, the horse must have his head tied so that he cannot get at it, or a cradle put on his neck, or he may pull it out with his teeth. Various ointments may be used to smear the seton in order to get up the required irritation. Setons should not be used in inflammations of the tendons and ligaments, because of the permanent thickening which is apt to result from their use.

Firing, or the application of the actual cautery, is a severe form of irritant, and is chiefly used in the treatment of bone diseases. The old method was to apply the iron in lines, but the use of the instrument here figured, Fig. 22, for pyropuncture is much less likely to leave a blemish.



Fig. 22.
Williams' instrument for pyropuncture.

The iron should be heated *red* hot, not a white heat, and applied with sufficient pressure to pierce the skin and to enter the new deposit. It may be necessary to cast the horse, but a twitchup is restraint enough for some.

Sutures used in veterinary surgery are chiefly the Interrupted suture and the Twisted suture. In preparing to close a wound by suture, great care should be taken to see that it is entirely clean before bringing the edges together. If several sutures are necessary, it is best to have as

many needles as there are to be stitches, all ready threaded to avoid delay in threading. Dip the needle and also the thread into a five-per-cent solution of carbolic acid to insure their being aseptic. Fig. 23 will show



FIG. 23.
Proper method of holding needle in making sutures.

very clearly how the needle should be held. Upon the longer or shorter distance from the edge of the wound it is desired to make the stitch will depend the length and degree of curvature of the needle. Figs. 24, 25, 26, 27 represent various suture needles. When the point of the needle



FIG. 24. FIG. 25. FIG. 26. FIG. 27.
Needles for making sutures.

emerges it should be seized and drawn through with sufficient thread to permit its being tied into a knot. It is then drawn together carefully so as to bring the edge surfaces of the wound smoothly together and securely tied, Fig. 29 and Fig. 30. The suture must not be drawn too

tightly, or inflammation and suppuration will follow; nor must the

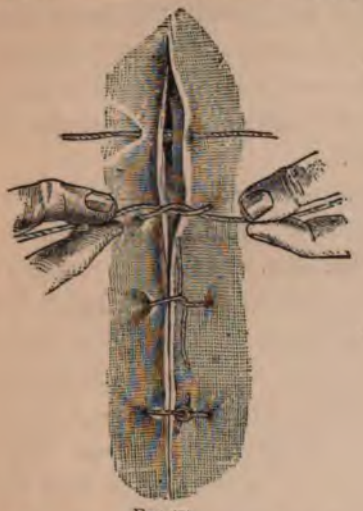


FIG. 28.
Tying the thread in making a knot.



FIG. 29.
Long and short stitch in making a suture.

knot be allowed to come directly over the wound. The reef-knot, Fig. 30, is the one commonly tied, though, when there is a tendency to gaping in



FIG. 30.
Reef knot.



FIG. 31.
Surgical knot.



FIG. 33.
Glasshead shawl pin.

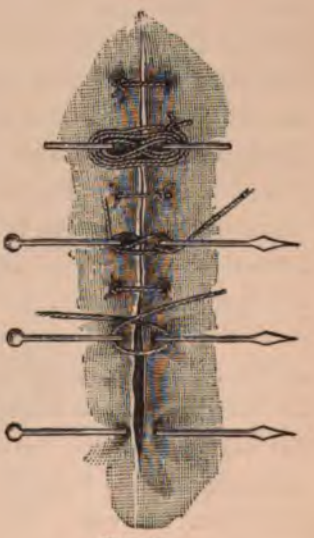


FIG. 32.
Twisted suture.

the wound a regular surgical knot, Fig. 31, should be used. The threads

should not be removed under ten days or a fortnight. To draw them out, cut the suture close to the knot and placing the finger upon the flesh between the line of the cicatrix and the point where traction is to be made, draw carefully and steadily out. If the hair has previously been removed around the wound, apply strips of sticking plaster to support the new line of union for a time.

The twisted suture, also called the pin and hare-lip suture, is made by thrusting pins through the margins of a wound and then winding a thread about them, as shown in Fig. 32. Fig. 33 shows the common black glass-head shawl pin which can be obtained at any store, and is the best for this purpose. The pins should be inserted from a half to three-quarters of an inch from the edge of the wound and brought out the opposite side at the same distance. After they are all in place, wrap the thread as shown. It will be an improvement to take an interrupted stitch between the pins as shown. The pins may be removed in from three to five days. Place the thumb and forefinger upon the loops of the thread and gently drawing them together, draw out the pin by a twisting or rotating motion to free it from any adhesion.

Slings.—It not infrequently happens that sick horses have a dread of lying down and stand until utterly exhausted, retarding and even preventing any cure of their malady. Every horse-owner therefore should know how to prepare and use slings. Most stables are so situated that a block and tackle can be fastened into the beams about the stall; if not, a four-post frame sufficiently high to make the cross bars line with the back of the animal, must be erected on which to stretch the canvas. If blocks are fastened to beams overhead, the arrangement will be as shown in Fig. 34 or Fig. 34*. In this case the sail cloth or whatever stout material is used to go under the belly and support the horse should be wrapped twice around two-inch rollers or sticks of wood, and thoroughly nailed.

If the frame is to be used—and in the country it is preferable, because everything necessary can be obtained at little or no cost—procure four crotched posts and set them in the ground a little more than three feet apart one way and five feet the other; let the crotches come about as high as the middle of the body, and on them rest on each side two strong horizontal bars; above the bars tie a stick across the other way from post to post to stiffen them, then walk your horse between the posts and fasten the cloth securely to the parallel bars on both sides, passing it under his



FIG. 34.
Horse in sling suspended with two blocks from beam overhead.

ly, just so that it fits snugly.



FIG. 35.
Horse suspended with one block from beam overhead.

The material used for the support should extend from the forelegs to just in front of the sheath in males.

If the stall is floored, get posts which will fit snugly between the floor and the ceiling, and nail them firmly at top and bottom. The horizontal bars may be tied securely to these uprights, a slight notch in the uprights will insure against slipping.

Bandages are often useful in veterinary practice to retain poultices, or blisters upon particular parts of the body, and also to protect a wounded part. They are not always easy to adjust, and a variety of methods are therefore given here to aid the inexperienced.

Fig. 36 shows the customary method of applying a roller bandage, with which all professional men are familiar.

Fig. 37 indicates a way of fixing a bandage upon the forehead.



FIG. 36.
Applying the roller bandage to the leg.



FIG. 37.
Bandage for the forehead.

Fig. 38 is useful in cases where the eye is affected in any manner; At the top a hole is cut through which one ear is thrust, while the bands tie under the opposite one.

Fig. 39 is formed of a piece of muslin cut twice as wide at the top as at the bottom, and affixed as shown. It is useful in poulticing or blistering on the under side of the jaw.

Fig. 40 shows a bandage for the front of the throat.

Fig. 41 a larger one, intended to cover the whole of the under side of the neck. Unless such bandages are thoroughly tied, as here



FIG. 38.
Bandage for Eye.



FIG. 39.
Bandage for the under side of jaw.



FIG. 40.
Bandage for front of throat.



FIG. 41.
Bandage for whole under side of neck.

shown, the constant motion of the horse causes them to retract and become loose and baggy.

Fig. 42 exhibits the simple manner of affixing a bandage to the withers.

Fig. 43 and Fig. 44, the more elaborate strapping necessary for the shoulder and elbow respectively.

Fig. 45 and Fig. 46 represent the bandaging of the rump and the back. A bandage for the buttocks is shown in Fig. 47.

Fig. 48 represents a bandage for the front of the belly. This, of course, can be shifted backward, as may be necessary.

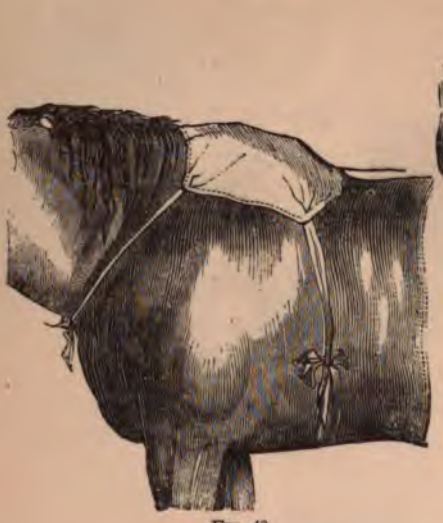


FIG. 42.
Bandage for withers.



FIG. 43.
Bandage for the shoulder.

Fig. 50 clearly shows a simple method of bandaging the foreleg above the knee, and Fig. 51, the hind leg above the hock.



FIG. 44.
Bandage for the elbow.

Of course, an ingenious person will have little difficulty in devising various ways of applying and retaining bandages upon all these different



FIG. 45.

Bandage for the back.

parts. It is necessary always to exercise care not to draw the bands used so tight as to check the circulation and thus do more harm than good,



FIG. 46.

Bandage for the rump.



FIG. 47.

Bandage for the buttocks.

especially when any bandaging is left for servants to do should they be

advised against such an error. Strings or cords should never be used—



FIG. 48.
Bandage for belly.

strips of list or muslin are more comfortable, safer, and equally secure.



FIG. 49.
Bandage for foreleg above the knee.



FIG. 50.
Bandage for hind leg above the hock.

Twitchups are among the most simple of the contrivances to distract the attention of the horse while he is being operated upon. A loop of rope, never less than three-eighths of one inch in diameter—and a half-inch is better—fastened to the end of a stout stick, constitutes the

apparatus. The rope is caught under the upper lip of the horse and twisted, until it tightly compresses the flesh; the degree of pressure is to be regulated by the necessities of the case, care being taken not to use undue violence. Fig. 51 shows the operation.



FIG. 51.
Showing the Mode of Using the Twitch.

Holding up a Forefoot will give considerable control of some horses. But others will contrive to kick badly, either forward or backward, with the hind feet, when thus held, especially if any of the weight is supported on the bent leg.

The Side-Line is a much more efficacious contrivance for controlling the horse.

A cart-rope is required as a side-line. Take a long, stout cart-rope, fold it equally once, then tie a knot so as to form a loop the size of a collar to sit comfortably on the shoulders; now place the loop on like a collar, and take the knot and ends of the rope between the fore legs; next carry one or both ends of the rope between the hind legs, and, having arranged them while standing behind the horse, bring forward each end, or only one end of the rope, and thread it tightly through the collar loop. The rope, or ropes, may be allowed to drop, so as to encircle the pasterns; then draw the rope tight, by standing at the shoulder just slightly behind the collar loop.

Another method is to use a collar, passing the rope through the ring, as shown in Fig. 52.

One or both feet may thus be controlled. When one leg is raised, it will be necessary only to draw it clear from the ground, so that the horse is entirely deprived of its support. To pull it too far forward will only make him nervous and restless, and be of no advantage.

Throwing or Casting.—No better instructions can be given for this operation than the admirable directions of Rarey, which are therefore quoted here in full:

"Everything that we want to teach the horse must be commenced in

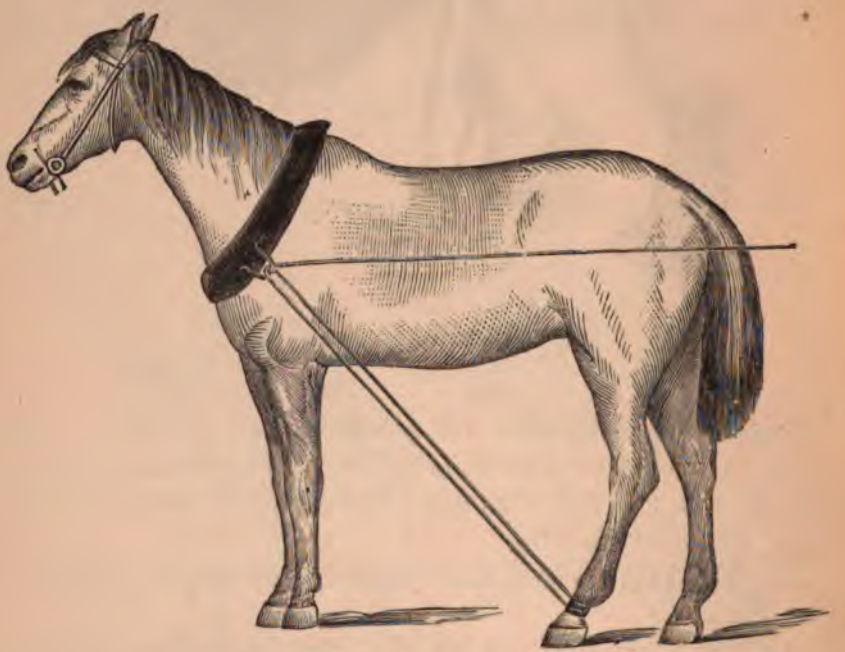


FIG. 52.
The Use of the Side-Line.

such a way as to give him an idea of what you want him to do, and then be repeated till he learns it perfectly. To make a horse lie down, bend his left fore leg and slip a loop over it, so that he cannot get it down. Then put a surcingle around his body, and fasten one end of a long strap around the other fore leg just above the hoof. Place the other end under the surcingle, so as to keep the strap in the right direction; take a short

hold of it with your right hand; stand on the left side of the horse; grasp the bit in your left hand, pull steadily on the strap with your right; bear against his shoulder till you cause him to move. As soon as he lifts his weight, your pulling will raise the other foot, and he will have to come on his knees. Keep the strap tight in your hand, so that he cannot straighten his leg, if he rises up. Hold him in his position, and turn his head toward you; bear against his side with your shoulder—not hard, but with a steady, equal pressure—and in about ten minutes he will lie down. As soon as he lies down, he will be completely conquered, and you can handle him as you please. Take off the straps, and straighten out his legs; rub him lightly about the face and neck with your hand the way the hair lies; handle all his legs; and, after he has lain ten or twenty minutes,

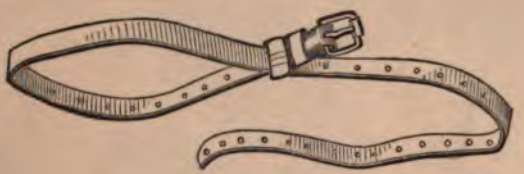


FIG. 53
Rarey's Strap No. 1.

let him get up again. After resting him a short time, make him lie down as before. Repeat the operation three or four times, which will be sufficient for one lesson. Give him two lessons a day; and when you have given him four lessons, he will lie down by taking hold of one foot. As soon as he is well broken to lie down in this way, tap him on the opposite leg with a stick when you take hold of his foot, and in a few days he will lie down from the mere motion of the stick.

RECAPITULATION AND MINUTE DIRECTIONS.

In practising the foregoing method upon a colt, he should be first accustomed to be handled, and taught to lead easily. In approaching a spiteful or vicious horse, you had better make your advances with a half opened door between you and him; gradually make his acquaintance, and teach him that you do not care for his open mouth; but a regular

biter mnst be gagged with a wooden bit made for the purpose, so large that he cannot close his mouth.

Of course there is no difficulty in handling the leg of a quiet horse or colt, and by constantly working from the neck down to the fetlock, you may do what you please. But many horses, and even colts, have a most dangerous trick of striking out with their fore-legs. There is no better protection against this than a cart-wheel. The wheel may either be used loose, or the animal may be led up to a cart loaded with hay, when the

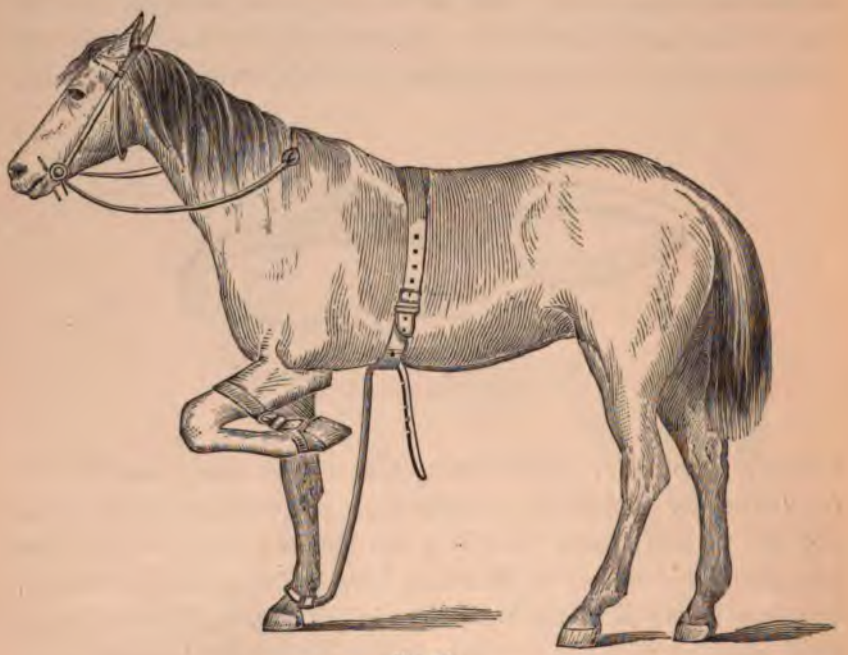


FIG. 54.

Horse with Rarey's Strap No. 1 in position.

horse-tamer can work under the cart through one of the wheels, while the colt is nibbling the load.

Having, then, so far soothed a colt that he will permit you to take up his legs without resistance, take the strap No. 1, pass the tongue through the loop under the buckle so as to form a noose, slip it over the near fore-leg and draw it close up to the pastern-joint, and fasten it as represented in the engraving (Fig. 54.) But you must not be rash in lifting the leg, and employ but little force in doing so. It is better to

wait until he lifts it willingly by the use of gentle means. Do not get out of temper if you have to make a dozen ineffectual attempts to raise it. The near fore-leg being securely strapped, and the horse secured from biting, if necessary, with the wooden bit, you will then make him hop about, as before stated. This he will learn to do easily. The trainer must, however, take care to keep behind his horse's shoulder and walk in a circle, or he will be likely to be struck by the animal's head or strapped up leg.

A horse can hop on three legs for two or three miles, if you give him his own time, and no plan that has ever been tried is equal to this for curing a kicking or balky horse. After you have tired him out pretty



FIG. 55.
Rarey's Strap No. 2.

well in this manner, you proceed to make him lie down, which process requires considerable patience and skill. For this purpose take strap No. 2 (Fig. 55), and making a loop with it put it round the off fore-leg. With a very quiet horse this can easily be done; with a wild or vicious horse you may have to make him step into it; at any rate, when once the off fore-leg is caught in the noose it must be drawn tight round the pastern-joint. Then put a stout glove on your right hand, pass the strap through the belly part of the surcingle, take a firm short hold of it with your gloved right hand, standing close to the horse behind his shoulders, and with your left hand take hold of the near rein; by pulling the horse gently to the near side he will be almost sure to hop; if he will not, he must be led. The moment he lifts up his off fore-foot, you must draw up strap No. 2 tightly and steadily. The horse will then go down on his knees (Fig. 56), for if you hold the strap tight he will not be able to stretch out his foot again. As soon as a horse recovers from his astonish-

ment at being brought to his knees, he begins to resist; that is, he rears up on his hind legs, and springs about in a manner that will sometimes alarm the trainer (Fig. 57). During these struggles you must not try your strength against the horse's strength, but merely follow him about, holding the strap just tight enough to prevent him from putting out his off fore-leg. As long as you keep *close to him*, and *behind his shoulders*, you are in very little danger. The bridle in the left hand must be used like steering lines, by pulling to the right or left as occasion requires; the horse, turning on his hind legs, may be fatigued by being forced to



FIG. 56.

The Horse on his knees.

walk backwards. The strap passing through the surcingle keeps, or ought to keep, the trainer in his right place; he is not to pull or in any way fatigue himself more than he can help, but, standing upright, simply follow the horse about, guiding him with the bridle so he will not precipitate himself against the side of the stable or room in which you are exercising him. When held and guided properly, he will soon sink down. Corn-fed horses will hold out longer than grass-fed ones, and the most energetic horse will scarcely struggle more than ten or fifteen minutes.

Usually at the end of eight minutes' violent struggles, the animal sinks forward on his knees, sweating profusely, with heaving flanks and shaking tail. If he still resists, he may be forced by the bit to walk backwards and forwards, but this is generally unnecessary, as by pushing gently at his shoulder, or by pulling steadily the off-rein, you can get him to fall, in the one case on the near side, in the other on the off-side; but this assistance should be so slight that the horse will not attempt to resist it. The horse will often make a final spring when you think he is quite beaten ; but at length he slides over, and lies down, panting and exhausted, on his side. If he is a pretty spirited animal, take advantage



FIG. 57.

Horse rearing with Rarey's Strap on.

of the moment to tie up the off fore-leg to the surcingle, as securely as the other, in a slip-loop knot.

Now let your horse recover his wind, and then encourage him to make a second fight. It will often be more stubborn and more fierce than the first. The object of this tying-up operation is, that he shall thoroughly exhaust without hurting himself, and that he shall come to the conclusion that it is you who, by your superior strength, have conquered him, and that you are always able to conquer him.

Under the old rough-riding system, the most vicious horses were occasionally conquered by daring men with firm seats and strong arms, who rode and flogged them into subjection; but these conquests were temporary, and usually personal · with every stranger the animal would begin his game again.

One advantage of this system is, that the horse is allowed to exhaust himself under circumstances that render it impossible for him to struggle long enough to do himself any harm. It has been suggested that a blood-vessel would be likely to be broken, or apoplexy produced by the exertion of leaping from the hind legs; but, up to the present time, no accident of any kind has been reported.

Treatment of the Horse after he is Down.

If the horse has fought hard in going down, he will then usually lie perfectly still, and you can gentle him, scrape the sweat off, and rub him down, smoothing the hair of his legs, and drawing the fore one straight out. In this position you have the opportunity of making him perfectly familar with you, and the more you fondle him and reconcile him to you the better. His head, tail and legs should now be handled with freedom, caressing and talking to him all the while. If he has hitherto resisted shoeing, handle all his legs with a view to accomplish it, and if he attempt to resist, continue until you subdue him, speaking to him with a voice of authority. If he is a bad kicker you may be obliged to confine his fore-legs; and with those tied, you may spend an hour in handling his legs, tapping the hoofs with your hand or a hammer—all this to be done in a firm, measured, soothing manner; only now and then, if he resist, crying, as you paralyze him with the ropes, "Wo!" in a determined manner. It is by this continuel soothing and handling that you establish confidence between the horse and yourself. After patting him as much as you deem needful, say for ten minutes or a quarter of an hour, you may encourage him to rise. Some horses will require a good deal of helping, and it may be necessary to draw out their fore-legs before them. The handling of the limbs of colts in this condition, particularly requires caution. A colt tormented by flies, will kick forward nearly up to the fore-legs. If a horse, unstrapped, attempts to rise, you may easily stop him by taking

hold of a fore-leg and doubling it back to the strapped position. If by chance he should be too quick, don't resist, for it is an essential principle of this system never to enter into a contest with a horse unless you are certain to be victorious. In all these operations you must be calm, and never be in a hurry, or in a passion."

Catheters.—It is sometimes necessary to empty the bladder of the horse by means of the catheter. Those used for the horse should be about thirty inches long, and provided with a stilette, Fig. 58. For the mare a metal tube curved as shown in Fig. 59, about twelve inches long, should be used.

The catheter is passed along the floor of the vagina in mares, preceded by the index finger of the left hand, which carefully raises the thin delicate valve guarding the urethral opening; it then enters the bladder, and urine at once flows readily. This precaution should be observed in all animals confined to a recumbent position, as untoward results may arise from pressure of the abdominal contents obstructing the flow of urine.

The *male catheter* is not so readily passed into the bladder, owing to the greater length of the urethral canal, which extends from the bladder to the end of the penis. Usually, however, the operation is not difficult if the ordinary precautions are observed, and spasm of the neck of the bladder is not too violent. When that occurs, the injection of opium, etc., as already named, may induce a partial relaxation if applied first. In



Fig. 58.
The male or flexible Cather, with Stilette.



Fig. 59.
Female Catheter for removing the Urine.

most cases the penis is relaxed, and hanging flabby and pendulous from nervous exhaustion, and therefore is readily seized; when it is contracted by strong spasm within the sheath, as sometimes happens, there

is difficulty in drawing it down, especially if the interior of the sheath is lined by an accumulation of black and offensive secretion, when washing by soap and water will be necessary. On the hand being passed up, the back only should be greased, the fingers being previously dried, a simple proceeding which will enable the operator to hold the penis more firmly, and maintain gentle traction, while the other hand softly rubs down the perinæum to hasten relaxation.

The penis being withdrawn from the sheath, the end must be examined for mechanical obstructions at the preputial opening, which often exist in the form of accumulations of sabulous or fine gritty paste, sometimes hardened, and by growth press upon the urethral opening and close it effectuallly against the passage of urine. These accumulations



FIG. 60.
The Male Urethra.

sometimes acquire such proportions and hardness as to merit the name of *preputial calculi*. They are readily removed by pressing the thumb-nail beneath from one side.

These preliminaries being arranged, the flexible catheter is passed in the following manner:—An assistant having rubbed it over with oil, and placed the stilette inside, the end is put within the urethra, and the whole tube follows in a straight line until it reaches the notch or turn at the ischium when the stilette is withdrawn; the tube is then pushed gently on as it rounds the bone, the operator using the left hand to direct it forwards, when it readily enters the bladder, and urine follows with a

gurgling sound. In some instances it may be needful to allow the catheter to remain, as in paralysis or atony of the muscular coat of the bladder induced by long-continued distention, an occurrence not altogether rare, as following a long journey, during which the animal has not had an opportunity of urinating.

CHAPTER II.

DISEASES OF THE RESPIRATORY ORGANS.

Catarrh, Common Cold, Coryza, Chronic Nasal Catarrh, Nasal Gleet, Ozæna, Chronic Cough, Laryngitis, Sore Throat, Angina, Bronchitis, Pneumonia, Inflammation of the Lungs, Pleuro-Pneumonia, Congestion of the Lungs, Pulmonary Apoplexy, Pleurisy, Pleuritis, Inflammation of the Pleura, Asthma, Broken Wind, Heaves, Thick Wind, Roaring, Highblowing, Whistling, Grunting.

NASAL CATARRH.

Synonyms.—Common cold; Coryza.

Definition.—Nasal catarrh is an acute inflammation of the mucous membrane which lines the nostrils. It is the same affection as cold in the head in the human subject. It is attended by a sero-mucous discharge from the nostrils, increased redness of the lining membrane, oozing of tears from the corners of the eyes, occasionally by swelling under the jaws, and by a snorting cough, with or without perceptible fever.

Etiology.—Nasal catarrh in adult horses usually arises from some neglect in the management of the animal or of the stables—from sudden changes of temperature, and from exposure to cold and wet. Young horses which have been at pasture, when first kept in warm stables, are frequently affected with it.

It is sometimes said to be epizootic; but it is far more probable that the same lack of ventilation, and bad management, which produces cold in one horse is the predisposing cause for the others in the same stable. It is naturally most frequent during cold damp weather.

Symptoms.—The premonitory symptoms are sneezing, loss of appetite, dulness of the eye, a rough coat, and dryness and redness of the mucous

membrane lining the nostrils, followed by a slight discharge, at first thin and watery, but soon becoming thicker, yellowish-white, and sometimes profuse. These symptoms are accompanied by slight fever. The bowels are usually constipated. In many cases the throat is more or less sore, and the animal has some cough.

If the disease be neglected, the glands under the jaw may become inflamed and swollen, and the throat may become positively sore.



FIG. 61.

Treatment.—This is usually a very simple matter if attended to promptly. Remove the animal to a loose box if possible, give abundance of fresh air, avoiding all draughts; warm clothing, if the weather be cold, and feed with bran mashes, and a moderate amount of good hay, cut, and moistened with water. One-half ounce of sweet spirits of nitre may be given daily, in the water, of which allow plenty. A few days of this treatment will usually effect a cure. Some horses are so particular about the water they drink that the slightest unusual peculiarity will cause them to refuse it. In such cases give the nitre in the mash.

If, however, the running at the nose be considerable and the cough troublesome, relief may be obtained by steaming the head frequently during the day. This may be done by keeping the head over a pail of hot water, which is stirred with a whisp of hay or straw; or, a more thorough method is to make a bag of some coarse material (an old grain bag will answer), half or twice as long again and of the same proportionate width as the ordinary nose-bag, with a broad strap to buckle over the horse's head. (Fig. 61.) Into this bag pour half a peck of sawdust or chopped hay, and upon this a gallon of boiling water,

mix thoroughly, and allow the superfluous water to drain off before applying the bag. If the patient becomes feverish, a dose of

Sweet spirits of nitre.. ..... ℥ ss.
Nitrate of potassium..... ℥ ij.

may be given once or twice a day for two or three days. Active purgative medicine in this, as in all diseases in which the respiratory organs are affected, should never be given. If the bowels are constipated, instead of the previous medicine, a dose consisting of

Epsom salts..... ℥ ij.
Nitrate of potassium.... ..... ℥ iss.

may be given twice a day until the desired effect is produced; or an injection of warm water (100° F.) may be administered. If the cough be troublesome, rub the throat with

Soap liniment..... ½ pint
Strong liquid ammonia..... ..... ℥ i.

or if a stronger irritant be desired, add another drachm of the ammonia.

Nasal catarrh, if neglected, may terminate in laryngitis, bronchitis, pneumonia, or other diseases of the respiratory organs. In some few cases it becomes chronic, and is then known as nasal gleet.

NASAL GLEET.

Synonyms.—Chronic discharge from the nose; Chronic nasal catarrh; Ozæna.

Definition.—Nasal gleet is the name given to a chronic discharge, generally intermittent, but sometimes continuous, usually from one nostril only.

The discharge usually falls freely away from the nostrils, and is not of that glue-like adherent character which is peculiar to glanders. In

ordinary cases, the matter is white and about the thickness of cream, generally uniform in character, but sometimes curdy, clotty, or lumpy. Occasionally it is yellowish in color. When the discharge is connected with disease of teeth, it generally has an offensive odor.

In ordinary cases the lining membrane of the nose betrays no symptoms of acute inflammation; but, on the contrary, its surface is of a pallid hue, and it is free from pustules or ulcers. These symptoms also distinguish this affection from glanders.

Etiology.—Nasal gleet is usually the result of neglected catarrh or of influenza.

It may also accompany chronic inflammation and thickening of the lining membrane of the nose; and occasionally from the back pressure of a diseased tooth upon the bone causing inflammation of the maxillary sinuses, or from impaction of food, during a fit of coughing, in the fossa of the turbinated bones.

Treatment.—Before the disease has really become chronic, the congestion of the membrane may generally be relieved and the membrane itself brought into a healthy state by the frequent inhalation of steam, which is most readily obtained applied by use of the steam bag (Fig. 15)—(see manner of use on page 22).

An ordinary fly blister may be applied over the region of the sinuses of the nose.

Chloride of lime sprinkled in the bottom of the manger, so that the horse may constantly inhale the odor, is said to be useful.

If, however, either from neglect or in spite of treatment the discharge becomes chronic, and nasal gleet, as defined above, is fairly established, there can scarcely be said to be any treatment on which we can place much reliance. Attention to the general health, good care, moderate but not violent exercise, and the administration of mineral and vegetable tonics, such as

Sulphate of copper,
Nitrate of potassium,
Powdered gentian ....āā ʒi.
Make into a ball with linseed meal.

One of these given night and morning, and continued for ten days, and then after the interval of a week repeated, is very beneficial in improving the state of the system. Or, instead of the above,

Powdered cantharides.....gr. vi.
Powdered gentian.....ʒ ij.
To be made into a ball with linseed meal,

may be similarly given. Improvement in the general health is the great object in the treatment. Nasal gleet, like all chronic diseases, is very difficult to cure; but nature, when fairly assisted, often enables the part to throw off the morbid action.

If, however, there is reason to believe that the discharge proceeds only from the lining membrane of the nostrils and that the sinuses are not affected, cold water may be thrown up the nostrils twice a day by means of a large syringe or, what is much better, Rey's tube (Fig. 62). The larger



FIG. 62.

Rey's tube for nasal injection.

tube should be about fifteen inches long, and one and a half inches in diameter, expanding, as shown, at the top. The short arm is about five inches in length and the aperture nearly an inch in diameter; on the short arm a closely fitting leather ring is slipped, four inches in diameter. This ring serves as a base to support wet tow or cotton wrapped around the arm which enters the nostril, and when that is compressed serves to close it completely, so that the fluid poured into the larger arm cannot escape, but rises until it passes over the septum and flows from the oppo-

site nostril. Nervous horses may have to be blindfolded. Gentle means will usually enable the operator to use this tube without difficulty. A solution of

Sulphate of zinc..... 3 i.
Water.....1 pint

or,

Carbolic acid..... 3 ij.
Water..... 1 pint

may be injected with this tube twice a day into the sinus affected and release the collected matter. After the matter has been released, the sinus will require to be washed out with tepid water by means of a syringe; and perhaps the membrane may require further treatment, as described in the next paragraph.

If the cause lie in the disease of a tooth, it may be possible to remove it; but generally this is not practicable, and we can hardly hope that any remedial measures will be effectual in arresting the discharge from the irritated membrane; we shall have the satisfaction of knowing, however, that the diseased action is not connected with glanders.

After a time—it may not be until after a considerable time—when such parts of the tissue as are disposed to do so have sloughed away, the discharge may cease; but in other cases the irritated membrane may continue to pour out mucus or pus, and trephining, as a last resort, offers the only hope of a possible cure.

After being opened, the sinus will need to be freely injected for some days with warm water in order to clear out the collected matter; after which, in some cases, it may be necessary to inject some mild stimulant, such as

Sulphate of zinc..... 3 i.
Water.....1 pint.

The action of the stimulant will at first excite increased discharge, but it will probably become of a more healthy character. If the discharge

continues to increase, the stimulant may be discontinued for a few days, and warm water again used.

In many cases, the lining membrane of the sinus will be found to be greatly thickened, and perhaps a quantity of dried mucus may be lodged within it, which will be gradually got rid of by the action of the injection. Care must be taken not to allow the skin to close completely the orifice, before the discharge has for some days entirely ceased.

During treatment the animal should be fed well. If the head is hot, it should be frequently bathed with cold water. Mineral tonics should be freely administered throughout.

When in spite of our treatment the diseased action of the mucous membrane continues, it becomes a question whether it is advisable to keep the animal. A horse with an unhealthy discharge from his nostrils cannot with safety be kept near others or worked with them. We cannot tell when such a case may run into glanders. The animal is therefore practically useless, and had better be killed.

CHRONIC COUGH.

Definition.—Chronic cough is a very troublesome affection. It may have its seat either in about the larynx, in the respiratory passages, or in the lungs.

Etiology.—It usually arises from morbid sensibility of the nerves of the larynx, or from irritability left in its lining membrane or in the bronchial tubes after pneumonia, bronchitis, or influenza. Or it may be connected with indigestion, and, indeed, it may be said frequently to be a symptom of that affection. An intimate connection, as the reader is aware, exists between the nervous system of the stomach and that of the lungs. Hence, derangement of the former is apt to set up irritation in the latter. Thus horses suffering from worms are often affected with chronic cough. It also constantly accompanies broken wind; and in some cases it exists without any appreciable cause. In horses subject to this disease, very trifling causes, such as the change from the atmosphere of the stable to the open air, or the mere act of eating or of drinking, or a change of weather, or a little unwonted excitement, such as a trot or a sudden blow, are often sufficient to produce irritation and consequently cough.

Chronic cough, when following bronchitis or influenza, is usually accompanied by an extra secretion of mucus; but we sometimes find it when the membrane is perfectly dry.

Treatment.—The treatment of the malady must depend on the cause from which it proceeds.

When the cough proceeds from irritability of the larynx, considerable benefit, even in cases of some standing, will be found to result from the application of external irritation to the throat. Chawner advises:

Croton oil.....15 to 20 drops.
Glycerin..... ℥ i.
Rub on throat and windpipe once every two days.

With a view of allaying the irritation which generally accompanies the passage of food down the throat, it useful to cut the hay and wet it; and five or six pounds of carrots may be given with the other food daily. The tendency to irritation is diminished by giving food and water often and in small quantities at a time.

If the cough appears to depend on disturbance of the lungs, as a sympathetic affection, the real cause, which is usually indigestion, must be treated. Careful attention should be paid to the diet, and an abundance of pure air must be afforded. The best and most nutritious food only should be given. Any distention of the belly, such as that caused by the use of bulky forage, always affects unfavorably the free movement of the lungs, whilst bad food will be certain to aggravate the indigestion. With a special view of avoiding any undue distention of the stomach, both food and water should be given in small quantities, and at frequent intervals.

In very many cases, whether the cough arises from irritability of the membrane of the larynx, or from the lungs, in sympathy with the digestive organs, much benefit will be derived from the administration of tar, either in water or in balls. For the purpose of impregnating the water, it will be sufficient to pour a quart of the best tar into a large cask, from which the water may, when required, be drawn; or the following ball may be given daily, viz.:

Tar .... ℥ i.
Linseed meal.....Sufficient.
Make six balls

If the cough has followed bronchitis, pneumonia, or influenza, and is accompanied with an extra secretion of mucus, with occasional discharge from the nose after coughing, or with a wheezing noise, mineral tonics, such as:

Sulphate of copper ..... 3 i.
Extract of gentian..... ..... 3 ij.
Linseed meal.. .....Sufficient.

given in a ball daily for a week will be beneficial. The effect produced must, however, be carefully watched. If the cough notwithstanding continues, a change of treatment may be desirable, and the box may be fumigated with tar. This may easily be effected by putting some tar in an iron ladle or an old pail, and plunging a bar of hot iron into it.

Chronic cough may be intermittent in its character; that is, it may be absent for a time, and then return as a dry, hacking half-suppressed cough, repeated several times in succession, although the horse may not otherwise be out of health. In such cases the following will be found useful:

Powd. camphor..... 3 iij.
Nitrate of potassium..... 3 viij.
Calomel..... ..... 3 iij.
Aloes..... ..... 3 vi.
Tar or turpentine.....Sufficient to moisten.
Make six balls.

Or,

Ammoniacum... .... 3 xi.
Powdered squills..... 3 vi.
Aloes..... 3 vi.
Linseed meal..... 3 xxiv.
Molasses ....q. s.
Make six balls.

One every evening for a few nights, after which it may be discontinued and repeated after an interval.

Horses affected with chronic cough, if kept in good condition, often continue for years good travellers; whilst, on the other hand, if the con-

dition falls off, the malady always increases, and is apt to degenerate into broken wind.

When, however, this affection accompanies, or rather is the result of serious derangement of the pulmonary system, such as broken wind, it is obviously incurable, because the cause from which it proceeds is incurable.

SORE THROAT.

Synonyms.—Laryngitis; Pharyngitis; Angina.

Definition.—Inflammation of the lining membrane of the pnarynx and larynx, not often fatal, but nevertheless a not unimportant disease, some-times killing quickly by suffocation, in spite of all efforts to afford relief.

Etiology.—Pharyngitis and Laryngitis are due to the same causes as common cold.

Symptoms.—The earliest symptoms are cough and difficulty of swallowing. There is generally a discharge from the nose, even in the earliest stages. The mouth is hot, and the horse is disinclined to eat; or perhaps "quids" his hay, *i.e.*, lets the masticated hay fall out of his mouth. He only sips his water, or takes it by small mouthfuls and swallows it by jerks. The horse also chews his food longer than common, in order to produce an amount of saliva which may shield the irritated membrane during its passage to the stomach. Hence we find much slobbering from the mouth, and frequently, in bad cases, when the animal drinks, a portion of the fluid comes back through the nostrils, and occasionally part of the food is returned in the same way. A short cough frequently accompanies each inspiration.

The pulse is quick and the respiration somewhat hurried. If the disease be not checked, the cough will become very hard and harassing, and we may expect fever to follow. Attention should not be diverted, however, to the fever from the real disease. The fever will subside as soon as the irritation which causes it is removed.

There is sometimes a slight enlargement, which may be seen externally, over the upper end of the windpipe. Any attempt to handle the throat is violently resisted. In severe cases the breathing is often ac-

companied by a roaring noise. This roaring sometimes becomes chronic after recovery from the disease.

Treatment.—In the earliest stage the treatment consists in removing the animal to a loose box, with an abundant supply of fresh air, but no draughts. The diet must be restricted to soft food. Use the steaming bag, as recommended for coryza, and keep it constantly applied, renewing the hot water as often as required, unless it appears to distress the horse; in which case remove it for a time and then readjust. One or two ounces of chloroform added to the water first poured in, will be likely to contribute to the relief of the animal. Apply hot fomentations to the throat, and tie it up with warm dry flannel. (Fig. 63.)

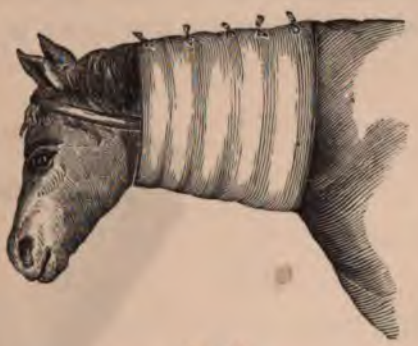


FIG. 63.

Neck tied up in flannel.

Grass is by far the best food, but when it cannot be procured, carrots, or bran mash, or linseed gruel may be substituted. Hay is wholly inadmissible, as it cannot be properly masticated, and its long, dry fibres will be certain to cause irritation in the throat.

So long as swallowing is difficult, all medicine should be given in the animal's food or water, the latter being kept always within reach. Demulcent drinks, such as linseed tea, hay tea, or gruel are useful and often acceptable.

The warmth of the body must be maintained by clothing, and the legs should be wrapped in flannel bandages. At intervals, according to the circumstances of the case, the bandages should be removed, and hand-rubbing applied until warmth is restored.

In the early stage of the affection, Gamgee recommends the use of a confection of:

Chloride of Ammonium..... ℥ ij.
Camphor .... ℥ j.
Molasses..... ℥ xx.

Mix. A tablespoonful occasionally to horses with a cough.

In very bad cases, the swelling of the parotid glands and that of the lining membrane of the upper end of the windpipe are sometimes so great as to cause imminent danger of suffocation. Relief must then be sought by tracheotomy. If abscesses form and point internally, they may require to be laid open with the lancet.

The accompanying fever is best treated by one or two ounces of sweet spirits of nitre in the water or in the mash. The bowels must be kept open by the use of laxative food, or, if need be, by injections of warm water (100° F.), using the instrument here figured in preference to a sy-

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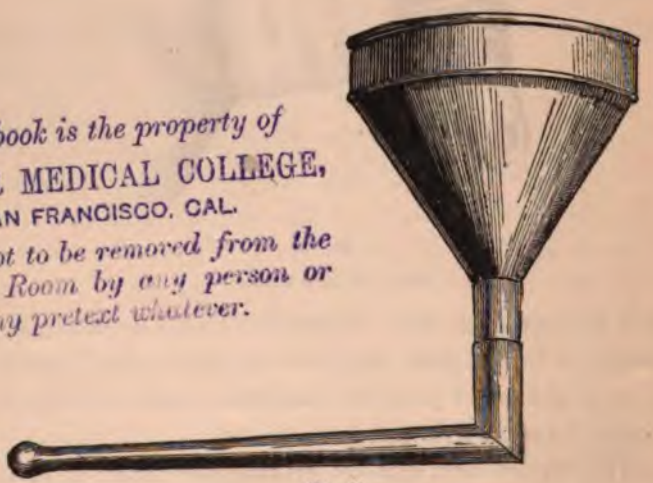


FIG. 64.

Gamgee's funnel for enemas.

ringe. (Fig. 64.) In all cases, throughout the attack, the animal's head should be left entirely free from restraint.

This disease is always succeeded by great prostration of strength; and in order to prevent this as much as possible, milk—in conjunction with eggs beaten up, or boiled hard and powdered—should be allowed the animal to drink, alternately with water, gruel, or linseed tea. But none of these should upon any consideration be forced upon it by horning or

bottling, as this is a dangerous practice, and one calculated not only to excite violent fits of coughing in all diseases of the throat, but indigestion, and disorder of the digestive apparatus in all other ailments, and thus destroy what little appetite the patient might possess.

Signs of Recovery.—The first sign of recovery is a slight mucous discharge from the nostrils, indicating that the inflammatory action is subsiding. There will also be some slobbering of saliva at the mouth, and the cough will become softer. The mucus discharged from the inflamed surfaces will be coughed up and gotten rid of, partly by the nose and partly by the mouth, and the cough will gradually cease. The swelling of the parotid glands and of the glands under the jaws will also gradually subside. The fever will cease with the cessation of the irritation which produced it.

During this stage, the following may be given with advantage—a dessertspoonful twice daily:—

Tannic acid..... ℥ i.
Brandy..... ℥ ij.
Honey..... ℥ vi.

Mix.

Or, if preferred, a tablespoonful every three or four hours of:

Camphor..... ℥ i.
Powdered alum..... ℥ ij.
Molasses..... ℥ xx.

Mix.

Sequelæ.—The after-treatment usually needs much care and attention. Some deposit on or thickening of the membrane generally remains after the attack has subsided, which may cause the horse to become a roarer; and in order to assist nature to remove it, and thereby lessen the chance of any such chronic affection, a mild stimulating embrocation rubbed daily upon the throat will sometimes prove efficacious. The following is recommended, viz.:—

Oil of turpentine,
Liquor ammonia,
Olive oil..... āā ℥ iv.

but it is often necessary to apply a strong blister of biniodide of mercury three or four times in succession on the seat of the disease.

Biniodide of mercury.....1 part.
Lard.....8 parts.
Mix intimately.

For a fortnight or three weeks give the horse twice a day of

Iodide of potassium.....3 i.

The animal should remain in a loose box until all irritation has completely passed away.

When the horse is thoroughly convalescent, it should not be too hurriedly put to work, because the membrane of the windpipe and throat will continue to be for some time very susceptible of irritation and inflammation. Great attention should also be given to the ventilation of the stable.

When the discharge from the nostrils continues for a length of time, even after the horse has in other respects recovered, the case must be treated as one of nasal gleet.

BRONCHITIS.

Synonyms.—Cold in the chest; Inflammation of the air passages.

Definition.—Bronchitis consists in inflammation of the lining membrane of the bronchial tubes. It may be acute or chronic.

Etiology.—Bronchitis is generally caused by exposure to cold, and is commonly the result of neglect of some kind—allowing cold air to blow on the animal; letting him stand unblanketed in cold weather after hard driving, or when wet.

Symptoms.—Bronchitis usually commences with slight catarrh and cough, and the horse is off his feed and a little feverish. At other times there are no catarrhal symptoms, and the only noticeable sign is feverishness and quickened breathing. This state of the breathing, if not carefully looked for, may easily escape observation.

The first positive sign of bronchitis is indicated by quickened breath-

ing, accompanied with a slight whistling or hissing sound, heard on auscultation, at the sides of the chest, or else by a deeper and more noisy sound in front of the chest. The whistling sound indicates inflammation of the smaller tubes; whilst the deeper sound indicates inflammation of the larger tubes. The peculiarity of these sounds arises from the passage of the air over the dry, inflamed membrane in the tubes. During this, or the "dry stage," the pulse is harder and quicker than natural, from 70 to 80 per minute, and as the disease progresses it becomes quicker and smaller, until in very bad cases it can be no longer felt. The breathing is also much quickened, and the membrane of the nostril is red and inflamed.

About the second day the dry state of the bronchial membrane is succeeded by a moist stage, with an increased secretion of mucus, accompanied with a suppressed cough. This change, though it has no particular significance, is yet often indicative of relief, inasmuch as it shows that one stage of the inflammation has passed. The pulse, which during the dry stage had been harder and quicker than natural, now becomes decreased in volume and increased in frequency. Should the lining membrane of the nose, which had been red and inflamed, become moist, and at the same time the secretion from it of a more natural character, it is a very favorable symptom.

If the mucus which is now secreted is not freely expectorated, it will accumulate either in the larger or smaller tubes, according to the location of the attack. In the larger tubes it affords considerable impediment to the respiration. The sound of the air passing through them is known as the "great" mucous râle. If the smaller tubes are attacked, the sound is more subdued and wheezing-like, and is known as the "small" mucous râle. The distinction between these two sounds should be very carefully studied.

Increase of the attack is marked by hurried breathing, dilatation of the nostrils, heaving of the flanks, much fever, a highly inflamed state of the lining membrane of the nose, and rapid prostration of the strength. A peculiarity of the breathing may also be noticed, namely, that the act of inspiration is performed with difficulty, whilst that of expiration is effected with comparative ease. The breathing may also be quicker than the pulse.

In pure oronchitis the throat is not affected. The disease is in the bronchial tubes, either great or small, but not in the larynx or trachea.

If, however, bronchitis supervenes on a previous attack of catarrh sore throat, the larynx and trachea will necessarily be involved.

Williams says, "In no case of pure bronchitis is the breathing pai ful, but short and quick, the thoracic as well as the abdominal muscl being brought into play; this distinguishes it from the breathing chara teristic of pleurisy, in which the ribs are more or less fixed, and the re piration abdominal. In ordinary cases of bronchitis, the animal is du listless, sometimes semi-comatose; hangs its head; is generally thirst ropy saliva fills its mouth, which is hot and moist. The visible muco membranes are affected, and present a varying degree of lividity, due non-oxidation of the blood. The animal stands in a coma, or moves lis lessly about. If in a box, and the door be open, it stands with its hea to the open air, from which it evidently obtains relief. The bowels a generally somewhat constipated, the fæces covered with mucus; but th easily respond to purgatives." The urine is high-colored. As the disea advances, if it be toward a favorable termination, the discharge from th nostrils will become more profuse, the cough more loose, and gradual the discharge changes to a more clear and thinner mucus.

Treatment.—As it is not possible to cut the disease short after its ve earliest stages, the treatment should be directed to leading it to an ear and favorable termination. Nearly all authorities agree that blood-lettir should be avoided; cough mixtures or expectorants are of no value; ar if the bowels are costive, on no account give aloetic purgatives, bu endeavor to secure proper movements by feeding, as directed hereafte Give plenty of water to drink. At the very earliest symptom the patie should be removed to a well-ventilated loose box, warmly clothed, ban ages applied to his legs, and his food wholly restricted to grass, carrot or bran mash.

Some sedative medicines will be needed, such as from five to ten dro of Fleming's tincture of aconite, every four hours (drop it into teaspoon and rub it on the tongue); but this medicine must not continued after the pulse has become soft, which in favorable cas is usually in about twenty-four hours. It may be given in anoth way. Add ten drops of Fleming's tincture to a tea-cup of water, and this give a teaspoonful every fifteen minutes until the animal swea freely. If aconite does not produce the desired effect in that time, i use should be discontinued. Its action on the system is too lowering admit of prolonged use.

After a time the pulse usually becomes weak and the patient is prostrated. Diffusible stimulants, such as carbonate of ammonia in doses of one drachm (well diluted with water), or sweet spirits of nitre or sulphuric ether (well diluted), in doses of one-half to one ounce, repeated every four or six hours, are now needed, and may be continued until signs of relief are apparent. If the horse is inclined to drink, half an ounce of nitrate of potassium may be dissolved in each pailful of water, until the kidneys are freely acted on. If the animal urinates profusely, it need not cause alarm, it being due to the effort of nature to throw off effete substances, and will pass off as the horse becomes convalescent.

Inhalation of the steam arising from boiling water poured over hay in the steam bag, as described on page 22, will also be found to give much relief, and should be made a main point of treatment. The steam relieves the irritated membrane and tends to loosen the mucus, and thereby relieves the cough. A small quantity of carbolic acid poured on the hay in the steam bag will serve to prevent the putrefaction of the discharge.

When, as is often the case, notwithstanding hand-rubbing and bandages, the legs remain persistently cold, rub them with a liniment of

Soap liniment	½ **pint**
Strong liquid ammonia	℥ i.

and then replace the bandages.

In addition to the above treatment, the front part or the sides of the chest should be stimulated with mustard. As soon as the irritant effect of the mustard has ceased, which will be in about fifteen minutes, it should be washed off. In about two hours the application may be repeated, and again washed off as before; and this process may be repeated at intervals until signs of relief are apparent.

If signs of recovery do not become apparent, the disease will probably extend to the lung tissue or to its covering membrane, and we shall probably have the case complicated with pneumonia or pleurisy. A horse may die of pure bronchitis, but in fatal cases the disease generally runs into pneumonia or pleurisy before death.

PNEUMONIA.

Synonyms.—Inflammation of the lungs; Lung fever.

Definition.—Pneumonia is inflammation of all the substance of the lungs.

Etiology.—Chill while hot and perspiring; sudden changes of temperature; badly ventilated stables. Pneumonia frequently supervenes on bronchitis.

Symptoms.—Sometimes the attack comes on very suddenly without any observable premonitory symptoms. At other times it starts almost imperceptibly, the animal being only slightly off his feed and his mouth hot. The attack is generally ushered in by sudden fits of shivering, followed by coldness of the ears and extremities and other usual signs of inflammation, and a staring coat. The coldness of the extremities is a marked sign throughout the disease. The horse is evidently uneasy, and turns his head frequently round to his chest. The pulse is accelerated and generally averages about eighty beats in the minute, at the commencement. The temperature in the early stage will be 103 to 106° F.

The nasal linings are paler than usual, but as the disease progresses, they become purplish, and then of a leaden hue. The respiration becomes disturbed as soon as the disease is established.

A very prominent symptom which marks this disease consists in the horse persistently standing with his fore-legs wide apart and his elbows out. He retains this position because it affords greater expansion to the chest, and therefore greater ease, than any other position. Horses affected with this disease or with pleuro-pneumonia are said never to lie down, except it be for a moment at a time or *in extremis*, when death from suffocation in general rapidly supervenes.

Cough may or may not be present. If present, it is sharp in the first instance, but as the attack progresses, it becomes of a dry and dull character.

According to Williams, there is some degree of constipation, but the fæces are mixed with flakes of mucus; the bowels are irritated, and do not tolerate purgatives.

With increase of the disease the breathing becomes quicker and more labored, although in pneumonia uncomplicated with pleurisy there is

an absence of any painful symptoms in the act. As the attack progresses, however, the breathing becomes much accelerated as it approaches the crisis. The fever is said to last from five to ten days.

If, during the early stage of the attack, the ear be applied to the chest, a confused humming noise, accompanied with a harsh, dry murmur, instead of the gentle respiratory sound peculiar to health, will be heard. The duration of the dry stage is very uncertain.

Pneumonia may attack one lung, or one portion of one lung, or both lungs. The extent and position of the attack may be ascertained by auscultation.

Convalescence is indicated by the return of the pulse to something like its normal condition, by restoration and continuance of warmth in the extremities, by a moist state of the nostrils, or the appearance of healthy mucus, and by the general relief of the symptoms of inflammation, and by a disposition to lie down.

If, on the other hand, the disease continues to progress, the mouth and nose will become cold, the nostril of a leaden hue, and the pulse fluttering and indistinct. The attack may terminate in effusion of serum, otherwise known as water on the chest, exudation of lymph upon the pleural surfaces, or in tubercles, abscesses, gangrene, etc.

A very unfavorable symptom is afforded by the discharge from the nose becoming of a brownish color. It indicates a high degree of congestion in the blood-vessels of the lungs. The change of color proceeds from oozing of the coloring matter of the blood through the over-distended coats of the vessels.

Occasionally the animal dies (from congestion of the lungs) about the fourth or fifth day, or even as early as the second day, before any of the latter described stages are reached.

Horses sometimes die of congestion of the lungs from hard riding or from plethoric state of the system.

Treatment.—Is given on page 70.

PLEURO-PNEUMONIA.

Definition.—Pleuro-pneumonia is inflammation of the lung and pleura at the same time. The disease may attack one lung or one por-

tion of one lung, but it more often attacks both lungs at once The pleuræ are generally involved to the same extent as the lungs.

Etiology.—The causes of pleuro-pneumonia are the same as those of pneumonia. Besides, it may prevail epidemically.

Symptoms.—The symptoms in the early stage are those of pneumonia, with the addition of the friction sound heard best over elevated ridges at the junction of the cartilages and the ribs. The pulse is more affected than in pneumonia, and less so than in simple pleurisy, and usually averages about 70.

In the second, or moist, and in the later stages, the symptoms are also similar to those which are detailed under the head of pneumonia and pleurisy, and are in fact, as we might expect, a combination of both.

A peculiar low form of pleuro-pneumonia often prevails as an epizootic in large towns, the early symptoms of which are very obscure. The animal merely shows dulness and loss of appetite and increased frequency of pulse. The respiratory movements are at first so little affected that unless the practitioner is on his guard and tests the state of the lungs by auscultation, the disease may make some progress before its real nature is suspected.

Treatment *of pneumonia and pleuro-pneumonia.*—When any of the premonitory symptoms, such as slight catarrh, fever, dulness, or loss of appetite appear, we must at once have recourse to an abundant supply of cool fresh air, abstinence from grain, laxative diet, entire rest, extra clothing, and warm bandages to the legs. In all cases, it is desirable that the animal should at once be removed to an airy, loose box. Diffusible stimulants are also beneficial.

If these simple remedies do not altogether avert, or at least bring about subsidence of the attack within a very short time, we must have recourse to medical treatment.

Bleeding, once the favorite treatment in this affection, is no longer countenanced by leading men. The horse should be placed at once in a comfortable loose box. Place pure water, not very cold, within reach at all times. Food will not be touched, unless it be a little well-made gruel, and not at all during the height of the disease. Keep the body warm by not too many blankets; and in rapid and painful breathing bathe the sides with warm water, as recommended in pleurisy. To prevent taking cold, rub the parts with

Soap liniment ..... ½ pint
Strong liquid ammonia ..... ʒ i.

During the first, or dry stage, sedatives, such as

Fleming's tincture of aconite..... ♏x.
Water..... .....1 pint

may be given once or twice, at intervals of four to six hours if the fever be high, but not otherwise, until relief—indicated by the pulse becoming softer in character and lower in number—is obtained. Aconite should not be used by any one not sufficiently experienced to distinguish the pulse accurately. It may also be given according to the method mentioned in the treatment of bronchitis; namely, by adding from six to ten drops of Fleming's tincture to a teacupful of water, and giving a teaspoonful every fifteen minutes until perspiration occurs.

Neutral salts dissolved in water have a marked effect in relieving the breathing. For this purpose, two ounces of sulphate of magnesia, or, one ounce of nitrate of potassium may be dissolved in a pailful of water, and the patient may be allowed to drink as much as he pleases. If he finishes the pailful, another may be given him. If the bowels are constipated, as is often the case, linseed oil in doses of from ten ounces to a pint is preferable to more active purgatives.

If the legs, notwithstanding friction and bandages, remain persistently cold, a mustard plaster may be applied to them, and washed off after fifteen minutes and the bandages reapplied; or they may be rubbed with a turpentine liniment, as

Oil of turpentine,
Liquid ammonia,
Olive oil.....āā ʒ iv.

Should moderate diarrhœa or excessive urination come on, do not check them. If the animal will eat, feed moderately with bran mashes, cut hay wet with water, boiled carrots, etc. No grain food.

Diffusible stimulants, which were recommended above during the premonitory symptoms, are not suitable during the dry stage, or at least during such portion of it as aconite is administered with the view of lowering the pulse. But when the strength begins to fail, as is often the

case after the dry stage has continued for some time, and during the second or moist stage, such diffusible stimulants as

Carbonate of sodium,
Camphor,
Extract of belladonna.....āā ʒ i.

or half an ounce of sweet spirits of nitre in a little water, repeated every four or six hours, are very beneficial, and may be given from time to time as may be required.

The inexperienced horse owner should very carefully consider the symptoms, and *if not quite sure* what is the right course to pursue with regard to the *internal* administration of medicine, had better confine himself to following the directions as to the loose box, water bathing, warm clothing, laxative food, and nitre (Capt. Hayes).

As the disease progresses, it is of the utmost importance to sustain the strength of the patient as far as possible, by giving him soft, nutritious food, by most attentive nursing, and by warmth applied to the body by means of clothing, etc.

It is necessary to call the particular attention of the reader to the distinction in regard to diet, which exists between the premonitory and the later stages of the attack. In the former the patient must be deprived of all grain, and fed on laxative diet. Such timely measures, combined with the loose box, will possibly ward off the impending attack, or at least prevent its becoming serious.

As a general rule, these diseases terminate quickly and favorably, and without any after injurious affects, when thus treated. When the system is unduly lowered, or the fever is aggravated by the use of violent blisters, we have reason to fear an unfavorable termination.

CONGESTION OF THE LUNGS.

Synonym.—Pulmonary apoplexy.

Definition.—This disorder is distinct from inflammation of the lungs and consists in an engorgement of the pulmonary blood-vessels.

Etiology.—Generally it is brought on by unaccustomed and sustained exertion, and more commonly occurs in hot weather and in fat horses.

I have known a very fine animal driven all winter in the city, and on a hot day, in June, driven some forty miles into the country, die from this disease in an hour after stopping. It is said to occur also from actual want of air in badly ventilated stables.

Symptoms.—Great distress; the fore-legs stretched widely apart; the nostrils expand and contract spasmodically; the flanks heave; there is a tremor all over the body which is bathed in a cold sweat; the extremities are cold.

Treatment.—Should be prompt to be of much service; if neglected for an hour even, it may be too late, and the animal will die of apnœa. If there is any wind, turn the horse's head so that it will blow upon his nostrils; bathe the legs and feet in hot water, rub them smartly, and finish by bathing with:

Liquor ammonia..... ℥ ij.
Tincture of arnica,
Water..... āā 1 pint.

then bandage with thick flannel up to the body. Give immediately:

Sulphuric ether,
Laudanum..... āā ℥ ij.
Water..... 1 pint.

May be repeated at intervals of fifteen minutes if it seems necessary. Two or three doses will usually suffice.

Or, if preferred, tincture of arnica is recommended in two-ounce doses.

See that the stable has plenty of fresh air, but no draughts. Watch constantly for twenty-four hours or until the attack has subsided; feed for several days upon mashes or gruel only. Water freely. Give one ounce nitrate of potassium in the mash. Keep the animal warm.

Some authorities recommend bleeding in severe cases, taking four to six quarts of blood; but the blood flows with difficulty and is thick and dark. It is questionable if it does much good; nevertheless, in these urgent cases bleeding may be resorted to.

PLEURISY.

Synonyms.—Pleuritis; Inflammation of the pleura.

Definition.—Pleurisy or pleuritis is an inflammation of the pleura, or delicate serous membrane which forms the covering of the lungs and also lines the cavity of the chest. In the epizootic form of pleurisy, it is preceded and accompanied by a low typhoid fever, lasting from seven to fourteen days. It is said to occur generally but once in a season, and one attack does not exempt from succeeding ones.

Etiology.—The disease is generally brought on by the same causes as those which produce other diseases of the respiratory system, and prevails mostly in the spring of the year, when the days are often cold and chilly; clipping is sometimes considered to be the cause; sometimes it is occasioned by some abnormal violence to the chest, or by its being punctured. In these latter cases the disease will be confined to one side only. Epizootic pleurisy is more or less contagious, and severe cases are capable of infecting other horses in the same stable.

Symptoms.—The disease at the outset is characterized by some degree of chilliness, manifested by a staring coat, and coldness of the surface of the body. This is, however, succeeded by signs of pain, often mistaken for colic, during which the horse paws almost constantly, and perhaps lies down and rolls; the animal eventually becomes stiff and sore, and if suddenly approached or if rapped upon the affected side will groan. The acts of respiration are performed rapidly and incompletely, the ribs are fixed, and the respiration is mostly abdominal. If listening to the chest is practised, a rubbing sound can be heard, and sometimes a very plain squeaking noise, like the creaking of leather, will be quite distinct. A dry, short, painful cough supervenes; the pulse is hard and quick, 60 to 80 per minute. If the side be closely examined, the muscles covering the affected part will be noticed to tremble or quiver; this lasts but a short time, and is succeeded by diminished motion.

When the muscles of the chest are involved to a considerable extent, the animal moves in a very rigid manner, steps slowly and very short; is greatly dejected, the back is arched, the skin exhibits great tenderness when subjected to pressure. Some cases have been noted that were so stiff and sore as to fall when compelled to move.

In a period of time varying from two days to a week, in favorable

cases, the dryness of the pleura is relieved by an effusion of serum from the overloaded vessels. The occurrence of the moist stage has not in itself either a favorable or an unfavorable significance. It is merely the course through which every inflammatory attack passes which does not at once end in resolution. At this, the second or moist stage, the friction sound, noted above as characteristic of the disease in its first stage, disappears, and the cough becomes loose and moist, and the extremities for a time become warm. The pulse becomes less frequent, smaller and weaker, the breathing less labored, and the membrane of the nostril loses its redness.

In from about twenty-four to forty-eight hours after the occurrence of the moist stage, we may look for a decided change either for better or for worse.

Subsidence of the attack will be indicated by the breathing becoming less hurried, by the pulse becoming softer and more distinct, and the cough less frequent, and by the extremities continuing warm. As in most acute diseases, recovery, when a favorable change once takes place, is tolerably rapid.

On the other hand, persistence of the attack is indicated by the extremities, which had, on the occurrence of the moist stage, become warm, again becoming and continuing cold; by a deep, scarlet color of the membrane of the nose; by a discharge of straw-colored serum from the nostrils; by a thready, wiry pulse, and by a rapid increase in the effusion of serum, otherwise called water on the chest, or hydrothorax; or in exudation of lymph, causing in some cases extensive adhesion of the pleura of the lungs to the pleura of the ribs, or very frequently in both.

As in pneumonia, it is necessary to caution the inexperienced against mistaking the earlier symptoms of either of these results for those of subsidence of the attack.

Treatment.—Stop all work at once; place the horse in a warm, light, well-ventilated loose box, taking care that cold air does not blow upon him; clothe the animal and bandage its legs sufficiently to keep it warm, but not too hot. Do not attempt to cut short the fever; both it and the attack must run their course, and the effort must be to alleviate them and assist nature to a favorable issue. If the fever be slight, the disease itself will run its course lightly, but if the fever be severe, the local inflammation will be likely to prove proportionately grave.

In the early stages of the attack, while the fever is high, benefit may be derived from the administration of

Fleming's tincture of aconite..... ℥x.

repeated two or three times a day if necessary. Some practitioners object to the use of aconite on account of its sedative action on the heart. Or aconite may be used as recommended in bronchitis and pneumonia.

At the onset of the attack, when the pain is the greatest, indicated by the groaning or grunting of the horse and attempts to lie down, looking around at its sides, etc., a dose composed of a mild purgative combined with an opiate will give relief, and sometimes abort the disease. Give

Laudanum..... ℥ iv.
Linseed oil..... ... ℨ xij.
One dose.

This may be repeated if the pain continues, but with the advent of the moist stage the pain will disappear.

If the pain is excessive, a hypodermic injection of

Magendie's solution of morphine..... ʒ xl.

will be useful.

Foment the sides with warm water, not hot, continuing the application for an hour at a time and then blanket; repeat this operation in severe cases three or four times a day. Williams' method of fomentation is as follows, viz.: Wrap the horse's body in a thick blanket or horse sheet, and pour warm water upon it, placing a tub so as to catch the water as it falls from the sheet, or wring cloths out of warm water and apply them to the sides. The latter method is the cleaner, as there is less water lost on the bedding, etc.; but in the former the skin is not exposed during the fomentation, and is to be preferred. When the fomentation is concluded, the wet sheets are to be covered with a water-proof covering, or, if removed, the skin lightly rubbed with weak ammonia liniment:

Liquid ammonia..... ... ℨ i.
Olive oil..... .. .. ℨ xvi.

for the purpose of preventing the sensation of cold which is apt to follow warm applications.

If the changes in the temperature of the skin be marked, give three times a day:

Sweet spirits of nitre..... ℥ i.
Water ....Half a pailful

and to stimulate the action of the kidneys

Nitrate of potassium..... ..... ʒ iv.

given in the drinking water night and morning.

Avoid purgatives, counter-irritants, and bleeding. Give a free supply of water; and to eat, bran mashes boiled, linseed mash, carrots, or grass if it is to be had. During convalescence give milk to drink, and if the animal is very weak, beat up an egg or two in the milk. A good tonic at this time will be of service:

Tincture of chloride of iron..... ℥ i.
Water..... .....½ Pint
Two or three times daily

Or,

Sulphate of Iron,
Powdered alum,
Powdered gentian.. ..... .āā ʒ ij.
Molasses.....q. s.
Make one ball.

Give one every eight hours for two days and afterwards one every twelve hours.

HEAVES.

Synonyms.—Broken wind; Asthma.

Definition.—Broken wind is said by Youatt to be "the rupture and running together of some of the air cells." It is non-inflammatory and usually becomes chronic and incurable.

Etiology.—Horses with narrow chests and protuberant bellies, if also gross feeders, are especially subject to this affection. Sometimes it gradually steals on a horse, commencing with chronic cough, whilst at other times it comes on suddenly, perhaps after hard work, with an overloaded stomach; and sometimes it occurs without obvious cause. Improper feeding; coarse, woody hay; not sufficient variety in food, or excessive amounts of it. Indigestion from any cause. Greedy feeders, and horses with a depraved appetite, who are specially liable to suffer from indigestion.

Symptoms.—The prominent sign of heaves is a double action of the flanks, caused by the inspiration of air into the lungs being performed with ease, while the expiration is made by two apparent efforts, at the conclusion of which the muscles relax, and the flanks fall with peculiar force.

During catarrhal affections the disease is often temporarily increased, and also at sudden changes of the weather, especially during fogs and easterly winds.

Treatment.—The peculiar symptom of flatulence, which is present in every broken-winded horse, shows pretty clearly that in the great majority of cases the disease is due to a disordered state of the digestive organs, rather than to previous disease of the lungs.

As regards treatment in incipient cases, especially in those which result from derangement of the stomach, there is reason to hope that removal of the causes and reversal of the conditions which have induced the malady, may check its progress, although we must not hope altogether to get rid of the disease. Therefore careful feeding and watering, and regular exercise are essential.

But when heaves has become chronic, whether it has arisen from inflammatory attacks on the respiratory organs, or from indigestion, or from emphysema—where, in short, any alteration has taken place in the structure of the lungs—the disease is obviously incurable, and active treatment is worse than useless. The best care, the greatest attention to diet, grooming, ventilation, and exercise are needed. A broken-winded horse should never be left idle for a day. When working, do not allow him to drink immoderately; a little oatmeal stirred in the water will make it better for him. Give a pint of linseed oil occasionally, if necessary to keep the bowels open.

Professor Law recommends:

Fowler's solution of arsenic..... ℥ i.
Fluid extract belladonna..... ʒ i.
Tincture of ginger..... ʒ ss.

Mix with a pint of water and give daily for a month or two.

Tincture of nux vomica in doses of two to four drachms continued for ten days or two weeks is preferred by some.

THICK WIND.

Definition.—Thick wind generally arises from thickening of the mucous membrane of the finer bronchial tubes and air cells.

Etiology.—Acute or chronic inflammatory disease, either of the bronchial tubes or the lungs. In the latter case, the bronchial tubes are also usually involved. It may also be produced by injudicious and violent exercise after watering, or when the stomach is full, or when the animal has been kept too long on soft food. It is also found in horses of a pampered, plethoric habit. In these cases it is probably due to nervous irritability of the lungs, sympathizing, as they readily do, with the condition of the stomach.

On account of the thickening of the mucous membrane, the horse labors much in his breathing, especially when the respiration is accelerated by work. The importance or otherwise of this disease mainly depends on the degree of thickening which has taken place, and the extent of lung affected. These points can in some measure be ascertained by auscultation over the region of the chest, after the horse has been made to exert himself. This disease is distinguished from broken wind by the inspirations and expirations being performed with equal quickness.

Treatment.—Treatment can only be palliative. Active measures are useless. Good condition, regular work, and very careful watering and feeding will mitigate the evil. Give small quantities both of food and water, at a time. Carrots are considered good; grass is better than hay. A pint of linseed oil given now and then, to keep the bowels in order and allay irritation of the mucous membrane, will be beneficial.

In France it is said to be the common custom to wet the food with molasses and water.

ROARING.

Definition.—Roaring is a very peculiar noise made usually in the act of inspiration, especially when the breathing is accelerated. In some cases it may be made both in expiration and inspiration. The sound is caused by obstruction in some part of the respiratory passages, and usually in the larynx.

Etiology.—Roaring is said to be due to paralysis and fatty degeneration of the muscles of the larynx; by some authors considered to be chiefly hereditary. There is considerable doubt concerning the existence of this cause. Among other causes are: Diseases of the nose; nasal polypi; depression of the nasal bones from previous fracture; osseous tumors in the nostrils; closing of one nasal chamber by false membrane or disease of the bones; tumors on the posterior nares, called "bellones," falling into the glottidean opening, causing intermitting roaring; constricting of the trachea; tumors in the thoracic cavity; distention of the gutteral pouches; disease of the pharyngeal and parotidean lymphatic and salivary glands; tight reining; fractures of the tracheal rings, or any cause of distortion of the larynx.

Treatment.—The treatment to be adopted, and the chance of a successful result in any particular case, must depend on the cause of the disease, and its being taken in treatment early. A confirmed roarer cannot be cured.

As, however, in broken wind and chronic cough, good food and regular work, with high condition, exercise a favorable influence, and may for a length of time render a roarer useful for many purposes; but with all our care the disease, when arising from the above causes, generally increases until the animal becomes useless.

If the roaring proceeds from a tumor in the nose, it may be possible to remove it. If it be caused by an obstruction in the air tube, arising from an injury or from the effect of an operation, it is possible that relief may be obtained by the application of a blister of:

Biniodide of mercury	1 part
Lard	8 parts

Bands of organized lymph across the trachea, or a band of that material

around its interior, are considered irremovable; though instances are recorded in which they are said to have been excised. In recent cases, arising from distortion of the larynx produced by tight reining, the best treatment consists in removal of the cause, and doing away with the check-rein, followed, if necessary, by rubbing daily or alternate days with:

Iodine	ʒ i.
Iodide of potassium	ʒ ij.
Lard	℥ ij.

Mix with very gentle heat.

If the roaring arises from a thickened state of the lining membrane of the bronchial tubes, such as may often be found after catarrh, laryngitis, etc., relief may very probably be gained, in recent cases, by applying irritants, such as biniodide of mercury (just mentioned above), repeated at intervals, to the exterior of the part affected; or a seton may be inserted on both sides, just behind the jaw.

HIGHBLOWING.

Definition.—Highblowing is not a disease, but is simply produced by the flapping of the horse's nostrils when expelling air quickly from his lungs. The larger, thinner, and more delicate the horse's nostrils are, the easier will it be for him to make this noise, which appears to be under his control. It is rarely heard except at the canter or gallop. It is generally considered to be a sign of good wind. One can imitate the sound near enough to understand how it is made, by bringing the lip slightly together and then blowing moderately strong through them. If one blows very hard, the vibratory noise is not made (Hays).

WHISTLING.

"This sound has been generally looked upon as a modification of roaring. I am, however, of the opinion that whistling and roaring are due to different pathological conditions of the larynx, and that they may

exist independently of each other; that roaring does not always terminate in whistling, nor whistling in roaring." (Williams.)

The peculiar sound, which is that of air passing through a narrow channel, arises from abnormal contraction in some part of the air passages. The seat of the contraction may be in the larynx, or it may be caused by thickening of the mucous membrane of the windpipe from previous inflammation of that organ. The causes of whistling are very similar to those of roaring.

Treatment.—The treatment is similar to that of roaring. In some cases a whistler may be capable of more exertion than a roarer; but in other cases an opposite result may be found.

GRUNTING.

Grunts are sometimes emitted by horses when struck or suddenly moved.

Etiology.—Any horse may do it which has been fed for some time on bulky food, and its belly thus distended. Horses also, which have been long in dealers' hands, and have been frequently examined as to wind, will sometimes grunt on being approached, on account of fear of a blow.

Such grunts may or may not have any connection with disease of the larynx; but the horses which emit them should be examined as to their wind with more than ordinary care. Grunting and roaring usually go together, though they may occur separately.

CHAPTER III.

DISEASES OF THE DIGESTIVE ORGANS.

Lampas, Choking, Indigestion, Gorging, Grain Founder, Gastric Impaction, Gorged Stomach, Impaction of the Stomach, Dyspepsia, Chronic Indigestion, Gastritis, Inflammation of the Stomach, Rupture of the Stomach, Constipation, Spasmodic Colic, Gripes, Belly Ache, Flatulent Colic, Windy Colic, Tympanites, Swollen Belly, Inflammation of the Intestines, Enteritis, Superpurgation, Diarrhœa, Bots, Worms.

LAMPAS.

Definition.—Lampas is a trifling ailment peculiar to young horses. It consists of an active inflammation and swelling of the ridges or fleshy bars of the roof of the mouth.

Etiology.—It is commonly connected with the process of dentition, and generally occurs about the season when the teeth are changing. Horses at any age, however, are liable to be affected by it through overfeeding. The soreness of the palate usually prevents the animal from eating oats or corn for a few days, and the inflammation sometimes causes slight feverish symptoms.

Treatment.—An immediate cure may be effected by scarifying the swollen bars with a lancet, but a few days of feeding wet bran and soft food will generally have the same effect, at the end of which time the inflammation will subside, and the animal will again feed.

The practice of burning the swollen bars with a hot iron is a brutal proceeding, and should never be tolerated.

INDIGESTION.

Synonyms.—Gastric impaction; Gorged stomach; Grain founder; Impaction of the stomach.

Etiology.—May be the result of a variety of causes: improper food; in most cases too great quantities of food; imperfect mastication; natural weakness of the stomach. In colts, removal from the dam at too early an age; drinking too cold milk, etc.

Symptoms.—Loss of appetite; a desire to eat dirt and filth; rough, hide-bound skin; possibly a dry cough; colicky pains an hour or so after food. In cases of gorging, the horse will, in a short time afterward, begin to show signs of distress which will increase rapidly; the body may be covered with a cold perspiration; the extremities are cold, pulse rapid; eructations of gas; attempts to vomit, which, however, are ineffectual further than the occasional flow of saliva from the mouth. The animal will lie down on his belly, and roll about and alternately stand up. He is disposed to stand with his head low down, and to press his forehead against his manger or the wall.

Treatment.—In all cases of simple indigestion, it is best to change the diet in some way, for a time at least. If a colt, give a dose of castor oil:

Castor oil.... ..... ℥ viij.-xij.

An older horse may have:

Powdered aloes,
Powdered ginger ..... āā ℥ ss.
Make into a ball with molasses.

After the cathartic has operated, give:

Bicarbonate of sodium,
Powdered gentian.... .. .. āā ℥ ss.
Powdered nux vomica..... gr. xxx.
Make one ball with molasses, and give two daily.

If the hair is thick, clipping is sometimes magically effective. Mod

erate exercise, thorough grooming, and food in moderate quantity must be an essential part of the treatment.

In cases of gorging, prompt efforts must be made to assist nature in passing the contents of the overloaded stomach into and through the intestines, and this can best be done by a strong purge:

Powdered aloes..... ℥ iv.
Powdered gentian..... ℥ ij.
Calomel ..... ℥ ss.
Make into one ball with molasses, and give at once.

If this does not act sufficiently, it may be repeated after forty-eight hours.

For the relief of pain, should it exist, give:

Sweet spirits of nitre..... ℥ ij.
Fleming's tinct. of aconite..... ..... ♏ v.

in a small mash, and repeat once or twice at intervals of two hours.

The subcutaneous injection of morphia may be substituted for this, and would be more rapid in its effect; inject forty minims in front of the sternum.

Apply hot fomentations to the belly, and do not allow the horse to throw himself violently upon the ground, which may cause rupture of the stomach.

Robertson advises, in cases where the discharge from the bowels is moderate, though not fluid, the daily administration for a time of:

Aloes..... ..... ℥ ss. to ℥ i.
Assafœtida,
Gentian,
Ginger..... āā ℥ i.
Molasses..... ..... sufficient.
In a ball.

Some advise also the throwing of a large injection well up into the rectum, which may be done with a Rey's tube.

INFLAMMATION OF THE STOMACH.

Synonym.—Gastritis.

Definition.—Inflammation of the mucous membrane of the stomach.

Etiology.—It is probably due to irritation of the mucous membrane caused by swallowing some poisonous substance.

Symptoms.—True gastritis is rarely seen or recognized in the horse except when it is suspected in consequence of some poison known to have been eaten or swallowed, or medicine improperly administered. If due to arsenious acid, the symptoms are great pain with uneasiness, the animal alternately getting up and lying down, tympanitic abdomen, fæces mixed with mucus, the saliva fœtid, and its secretion increased; mouth hot, extremities cold, nausea, purging, and great prostration of strength, with delirium. When the irritation is caused by the bichloride of mercury, there is, in addition to the above symptoms, a profuse discharge of saliva from the mouth.

Treatment.—Give at once the usual antidotes for the poisons.

RUPTURE OF THE STOMACH.

Is not fortunately a common accident. Robinson says of its

Symptoms.—"When an animal suffering from gastric engorgement and distention with much abdominal pain, being very uneasy, tossing himself about with violence, suddenly becomes quiet for a short time with a distinct change in the expression of his countenance, in which is now marked great anxiety, with short, quick respiration, regurgitation of fluid or more solid ingesta from the mouth and nose, with attempts at vomition, pulse becoming quicker and more feeble, the probability is that the walls of the stomach have become torn. In some instances there are additional symptoms, such as sudden fits of perspiration, a blanched state of the mucous membranes, cold and clammy mouth, tottering or staggering gait on being moved, or a disposition to move feebly around the box with his nose to the ground.

When the lesion has taken place at once, and exists as the primary affection, often occurring while at work, from which he has been removed

on account of the exhibition of pain, there may not at first be great uneasiness immediately accompanying the rupture; but very shortly this becomes a prominent symptom, chiefly from the escape of the contained material into the peritoneal cavity and consequent inflammation of the membranes and organs there. Rapidly the pulse and respirations become affected, and show the same characters as in other form—sinking with anxious expression of the countenance, attempts at vomition, and, it may be, sitting on the haunches. As the case advances, the pallid state of the mucous membranes, and the cold, clammy condition of the mouth, become more marked. During the progress of the symptoms the feeble and frequent condition of the pulse is persistent; while towards the termination the animal may show little pain, but stand persistently, until he finally drops; at other times he is violent to the last, gradually becoming unconscious."

No treatment will be of any avail, administration of medicines has been observed to add to the distress of the animal. A fatal termination is inevitable.

CONSTIPATION.

Definition.—A condition of the bowels in which the fæces are wholly retained or scanty, hard and small.

Etiology.—Mechanical obstruction of some kind in the intestines, insufficient peristaltic motion, and defective secretions in the bowels.

Symptoms.—The evidences of constipation are not usually very pronounced, except when of long standing, in which case the hair is long, the coat staring and rough, slight swelling of the extremities, sometimes a distended condition of the belly, and loss of appetite. In all cases, the animal, during the act of voiding the fæces, will be seen to strain. The fæces will be small hard, dry balls, although it is said that, in some cases, the local irritation from the hardened masses will excite a watery secretion which may give the appearance of diarrhœa. There is not usually an accompaniment of pain.

Treatment.—In mild or recent cases, careful attention to the diet, which should be as varied as convenient, and somewhat laxative, will usually effect a cure. An enema of tepid water and sweet oil, twice a day, for a day a two, will be found useful. In prolonged cases, a good purgative, at first, may be necessary, and aloes may be used, as:

Aloes..... 3 vi.
Gentian..... 3 ij.

or for young or not strong horses:

Linseed oil..... 1 pint.

SPASMODIC COLIC.

Synonym.—Gripes.

Definition.—Colic is spasmodic contraction of the muscular coat of any part of the intestines. It is liable to run on to inflammation, although this is not probable in the great majority of cases.

Its usual seat is in the small intestine, although it may arise from impaction of food in the large intestine. Colic, of itself, rarely causes death, and the trouble commonly disappears after a few hours.

It is always accompanied by pain, of an intermittent character.

Etiology.—The causes of colic are various, but in a great majority of cases it arises from some impropriety in feeding. Any sudden change of diet, or bad food of any sort, which is not easily or properly assimilated, or an excessive quantity of food at one time, especially after a long fast, when the stomach is always weak, is apt to produce irritation and spasmodic affections of the intestines. In horses which are predisposed to colic, very slight causes are sufficient to bring on an attack.

Among other common causes are worms, obstructions in the intestinal canal, such as hair balls, calcareous or other accretions resulting from the use of hard or mineral waters.

Colic may also be produced by those causes which induce indigestion generally, such as a lack of gastric and intestinal juices, which prevents complete digestion; or mastication may not be properly performed; or the secretions of the salivary glands or those of the liver may be bad or defective; or the peristaltic motion of the intestines may be sluggish from general debility, or from costiveness. All these causes, however, are aggravated, if not in many cases produced, by improper feeding and watering, aided perhaps by want of due exercise.

Colic is sometimes ascribed to drinking cold water, but, unless the body is exhausted by hard work, or overheated, it is doubtful if it can be the primary agent. Crib-biting is a still more doubtful cause of colic.

Symptoms.—The early sign of colic is sudden pain evidently in the

region of the intestines, as indicated by the horse looking anxiously round to his flanks. As the pain increases, the patient will become more restless, paw, kick at his belly, lie or throw himself down, and get up again frequently, or roll over, or kick. The nature of the disease is further recognized by the spasm soon passing away. After a short interval, it returns, however, and the same anxious looking around at his flanks and struggling is repeated.

During the paroxysm of pain, the pulse is much quickened and the breathing accelerated; during the intervals, or in the remission of the spasm, they return to the normal. The mouth continues moist, and the mucous membrane of the eye is not affected. During the attack, there is usually a frequent passage of hard angular dung pellets. Ineffectual attempts to pass urine may be made frequently.

If the disease is not soon relieved, the pulse becomes very frequent and contracted to a thread. If the spasms continue for six hours or more, there is ground for apprehension. In protracted cases the result is doubtful.

The favorable indications are an increase in the intervals of time between the attacks, and each attack becoming slighter than the preceding one. Again, if the animal passes wind freely and also soft dung, it is a favorable sign. The increase or decrease of the attack is also indicated by the increasing or decreasing tenseness of the belly.

It is especially to be remarked that the extremities continue warm and the skin remains in its usual state. The symptoms are only those of great spasmodic pain. There is no inflammation present.

Treatment.—Spasmodic colic being almost invariably caused by an irritant of some sort in the bowels, the most rational treatment is directed to removing this as soon as possible. For this purpose administer at once an active cathartic·

Aloes	℥ viij.
Tincture of aconite	gtt. xxx.

Give in a pint of water as a drench, or the aloes may be given alone in a ball, made up with bran, or linseed meal, and molasses, varying the dose from ℥ v. to ℥ x., somewhat in proportion to the size of the horse.

If the aloes, which are decidedly preferable, are not to be had, give:

Linseed oil..... 1 pint.

or,

Linseed oil..... 1 pint.
Sulphuric ether..... ℥ i.

The following is also recommended:

Oil of turpentine..... ʒ ij.
Laudanum..... ℥ i.
Linseed oil..... 1 pint.

In connection with the first prescription, if the pain is great, give:

Laudanum..... ℥ ij.
Warm water..... ℥ viij.

or, if preferred, a hypodermic injection of morphine may be given:

Magendie's solution..... gtt. xx. to xl.

Usually, the front of the sternum is selected for injection. Rubbing the belly and legs often gives comfort to the sufferer, and some advise injections of one sort or another, but the spasm is commonly so far up in the intestines that they are of little value.

A horse attacked with colic will sometimes be exceedingly violent, and care must be exercised in approaching him.

Watch a horse with colic for some hours after the apparent subsidence of the attack, and especially if it occurs at night, look after him frequently. In all cases give a purgative; for, as the attacks may continue, it is not impossible, if left for the night, the animal may be found dying or dead in the morning. A favorable sign of recovering is the free passing of urine.

FLATULENT COLIC.

Synonyms.—Tympanites; Swollen belly.

This is more to be dreaded than spasmodic colic, on account of the serious results which may ensue. It is apt to be a chronic condition.

Etiology.—Imperfect digestion from improper food, or it may arise independently of any known cause; if it occurs during the progress of any other disease, it is indicative of exhaustion of the animal powers.

Symptoms.—More or less distention of the belly, which is resonant on percussion. The expression of pain is not so acute as in spasmodic colic, but more constant; there is more or less delirium; the animal is unsteady upon his feet, and his extremities are cold.

Treatment.—Give a cathartic:

Castor oil	℥ xij.

or,

Linseed oil	1½ pints
Laudanum	ʒ ij.

and in addition:

Solution of ammonia	℥ viij.
Oil of turpentine	℥ i.
Linseed oil	½ pint

or, if preferred,

Asafœtida	℥ ij.
Tincture of opium	℥ ss.

in a pint of water.

Cases of slight colic, with intervals of considerable length, in which the animal is free from pain, are sometimes continuous for several days. The bowels do not respond freely to the effect of cathartic medicine recommended, and slight pains return at intervals. Such cases are always dangerous. They seem to arise from some defect in the biliary secretions. They are best treated by administering five grains of calomel on the tongue, every hour, until the bowels are acted upon.

INFLAMMATION OF THE INTESTINES.

Synonyms.—Peritonitis and Enteritis.

Definition.—Enteritis is an inflammation of the mucous membrane of the bowels, and is said to be the most rapidly fatal inflammatory disease to which the horse is liable, destroying life in a few hours.

Etiology.—Inflammation of the intestines may occur as a sequel of colic, or it may arise from continued constipation, or from any of the many causes which induce indigestion, or from intussusception, or from excessive action of a purgative. It is more likely to be produced, however, by washing with very cold water while the animal is heated, by exposure to cold, or by over-work. Peritonitis is occasionally caused by any wound of the membrane covering the bowels and lining the abdominal cavity, and often by castration.

Symptoms.—Unlike colic, which comes on suddenly, enteritis is usually preceded by dulness, lack of appetite, and feverishness, while repeated small evacuations of fæces are noticed.

After a short time, pain sets in *and is constant.* The animal becomes very restless, stamps and paws, looks anxiously at his belly, breaks out into a profuse sweat, the body is hot and cold by turns.

The *early* symptoms are the same as those of colic, but with this marked distinction which at once shows the disease, namely *the absence of any intervals of ease.* The pain, though in general less violent, is continuous throughout, and the pulse from first to last is accelerated to a high degree, to double or perhaps treble its usual number. In colic relief is usually experienced from rubbing the belly, but in enteritis it is exceedingly tender, and touching it gives pain.

The further symptoms are those usually present in inflammatory attacks, namely, cold extremities, dry mouth, and either unnaturally hot or cold hurried and oppressed respiration, unduly dilated nostrils, with an erect and quivering tail. As the disease progresses, the pulse sinks, and the legs and ears feel death-like cold. The mouth feels chilly.

Treatment.—Relieve the pain, if possible, by a dose of

Laudanum..... ℥ i. to ℥ iij.

or a hyperdermic injection of

Magendie's solution of opium.....gtt. xx.-xl.

Some highly recommend the use of extract of belladonna in place of the above, in doses of an ounce, and subsequently, at intervals of six hours, smaller doses of two drachms.

In the preliminary or very early stage, if the animal is a strong one

and the pulse is full and hard—not weak, nor above 80 beats in the minute—blood may be drawn, until an alteration is effected in the character of the pulse.

As long as the pulse is hard and full, stimulants will be injurious; but at a later period, when prostration supervenes, as it usually does, and the pulse becomes small and quick, they will be needed.

If on the other hand the pulse, even in the preliminary or early stage, is small and wiry, and such is generally the case, if the extremities are cold, and if there is great prostration, blood-letting will certainly be injurious.

Again in all cases, both with a view of exciting external or counter-irritation and also for the purpose of alleviating the pain, it is most essential to apply to the abdomen hot blankets steeped in boiling water in which a little mustard has been put, say a tablespoonful to a pint of water. When the fomentation is discontinued, blanket the horse well to keep him warm.

Avoid the use of all cathartics; do not try to force the contents of the bowels through the inflamed parts. Injections of warm water may be tried a day or two after the severe symptoms have abated.

When the appetite returns, feed small quantities of food at a time, and let it consist entirely of boiled substances—bran mashes, thin oatmeal porridge; milk and water may be given sparingly and in small quantity at a time.

Some cases, properly treated, will terminate quickly and favorably, but the result is always doubtful. If an unfavorable result is likely to ensue, the duration of the attack is generally short, and if a favorable change does not take place in from twelve to twenty-four hours, the case usually terminates fatally.

The disease may also terminate in effusion of serum into the abdominal cavity, otherwise called ascites. This termination will be apparent by a dropsical state of the legs and sheath, as well as by swellings under the belly. There will be tenderness on the application of pressure to the belly, and also a straggling gait of the hind quarters in walking. The breathing will be quickened, short, and painful, and the patient may probably lie down at full length and groan. The treatment of such an after-result will consist in good nursing and judicious, but not over-feeding, with nutritious diet, and the administration of tonics.

In due time, as strength returns, the absorbents and blood-vessels will take up the effusion.

DIARRHŒA.

Synonym.—Scouring.

Definition.—A condition in which there is a number of loose, partly fæcal or watery discharges in twenty-four hours, commonly without pain. It is often a natural effort to expel some irritating substance, and in such cases will disappear with the removal of the cause. It may be a symptom of enteritis.

Etiology.—Change of food from dry hay and grain to grass or any soft feed; raw potatoes; improper food; an excessive dose of medicine; constitutional tendency.

Symptoms.—Purging; the dung being more or less thin and fluid, dirty brown in color, and with little odor; or clay-colored and fœtid, The horse loses flesh, sometimes rapidly, if the disorder is unchecked.

Treatment.—When diarrhœa arises from irritating substances in the intestines, a mild cathartic will be useful:

Castor oil..... ℥ x.

or

Linseed oil.....1 pint.

Change the diet which may have been the cause of the trouble. If there is apparently considerable abdominal pain, the following ball may be given:

Powdered opium..... ʒ i.
Powdered catechu..... .... ʒ ij.
Prepared chalk..... ʒ iv.
Molasses..... ..enough to hold together.

Robinson recommends for pain in diarrhœa a draught of

Spirits of nitrous ether..... ℥ ij. to ℥ iv.
Powdered camphor..... .... ʒ i.
Laudanum..... ... ℥ ij.

To be given in a quart of wheat flour gruel, and repeat in one or two hours if needful.

If, however, the animal is restless and it is not possible to give him a drench, morphine may be injected subcutaneously:

Magendie's solution of morphia.....♏ xl.

Fomentations of the belly with hot water, and afterward rubbing with soap liniment is often grateful to the horse. The body should be blanketed after this. Care should be taken not to check the discharge too suddenly, and mild treatment should first be tried. Not uncommonly proper attention to the feeding and watering will work a change without recourse to medicine. Give bran mashes for several nights and thin flour, or better oatmeal, water in place of all clear water for drinking. Keep the body warm with clothing, and the horse quiet.

If the bowels do not regain their normal condition after the action of this medicine has ceased, give several times a day:

Powdered chalk,
Hyposulphite of sodium.....āā ʒ i.

mixed in the food, and if the discharges continue with much fœtor, give:

Oil of turpentine,
Laudanum.....āā ʒ ss.
Eggs.....3

beat up in a pint of tepid water and give for one dose. May be repeated two or three times daily.

SUPERPURGATION.

Definition.—Is a result of over-excitation of the intestines by purgative medicines.

Etiology.—It may be caused by giving too strong a purgative, or by giving a second dose before the first has had time to act. The longer a purgative is retained in the body the greater is said to be the danger from its superaction. Williams says:

"Superpurgation does not always depend upon the strength of the dose. In some instances as little as four drachms of aloes have been succeeded by fatal consequences. Again, horses in an obese condition, and those suffering from slight colds, are easily acted upon by purgative medicines, and are apt to sink from superpurgation. A full dose of aloes, from six to eight drachms, operating quickly, is seldom succeeded in healthy animals by any evil consequences; the same quantity, however, if divided into two or more doses, has a much more depressing effect, and is apt to be followed by serious consequences. In the first instance, the quantity, by its strength, insures its own expulsion; whilst in the second, the aloes is absorbed into the circulation, excites a toxic effect upon the system generally, and reduces the horse to such a state of debility that it succumbs to the purgative influence. The explanation of the tendency to superpurgation in the horse is to be found in the fact that its bowels are extremely vascular in comparison with those of other animals, and that the effect of the purgative acting upon so vascular a surface is grave and serious. I have already pointed out that many young horses, when first brought into the stable, are rendered susceptible to various diseases by the debilitating influences of indiscriminate purging, and that such a method of treatment is uncalled for and irrational. In addition to the symptoms described by Messrs. Haycock and Field, I have observed that those of laminitis are induced by purgatives, and that when they occur they indicate a condition of great gravity.

"The post-mortem appearances are those of congestion of the intestinal mucous membrane generally, concentrated in many cases in that of cæcum caput coli; a thick, tarry appearance of the blood, and extreme blackness, congestion or apoplexy of the lungs, the blood being, as it were, deprived of its watery elements, altered in its composition, rendered too viscid to circulate through the pulmonary capillaries, and so altered chemically as to be rendered unfit for perfect oxidation.

"In order to prevent the occurrence of superpurgation after the administration of an aloetic, or, more particularly, a mercurial and aloetic purgative, it is necessary that the practitioner should order the animal to be fed on an easily digestible diet, such as warm bran mashes; that the quantity of water should be restricted, and that the chill be taken off it, for nothing is so apt to induce inordinate intestinal action as large quantities of cold water whilst the animal is in physic. It is also necessary that no green food, roots, or other articles of diet, containing much

water, and laxative in themselves, should be allowed at this period. If a purgative does not seem to take effect in from twenty to twenty-four hours after its administration, moderate walking exercise is to be prescribed, for it is a fact that the longer a purgative is retained in the body, the greater the danger from its superaction; if, however, purging has actually commenced, exercise, by increasing it, is apt to cause harm. It is therefore necessary to keep the horse quiet until the physic has 'set.'"

Symptoms.--Constant purging; debility; weak pulse, a very offensive smell from the fæces; fœtid breath; eyes becoming glassy, and if the bowel become occluded by inflammation, great distention of the belly.

Treatment.—So long as the horse remains moderately lively, the pulse but slightly accelerated, the countenance natural, and so long as some appetite remains, it is unnecessary to take any active measures to restrain the purging, which is the natural and physiological response of the intestines to the action of the cathartic; it is therefore irrational and dangerous to check it, and all that is requisite is to allow the horse to partake of demulcent drinks, such as thin flour gruel, if it will do so spontaneously, at the same time keeping it perfectly still, warmly clad, and taking care that it does not drink too freely of anything whatever. Should there be any colicky pains, moderate doses of opium are to be administered. Care, however, must be taken that the purging be not checked even by these means too suddenly; as the consequence of this might be congestion of the intestinal mucous membrane, denoted by tympanites, great prostration, cessation of the purging, etc., finally terminating in death.

If the purgation continue, an endeavor should be made to overcome it gradually but not too quickly. For this purpose laudanum, chalk, and flour gruel are recommended:

> Laudanum,
> Prepared chalk..... āā ʒ ij.
> Give as a drench mixed with a quart of wheat-flour gruel,

every three or four hours until the purging is checked; hot applications being in the mean while applied to the abdomen, great care being taken that the animal has no access to cold water or other fluid, as its thirst is great and it is apt to drink inordinately; but it is essential that it should have small quantities of flour gruel or other emollient drink, not only

to allay the painful and feverish thirst, but to keep the blood in a proper fluid condition to circulate through the minute pulmonary capillaries. If the prostration be very great, stimulants, as wine or brandy, are to be tried; if they seem to act beneficially, they are to be continued, but not otherwise.

BOTS.

Definition.—Bots are a species of worms found in the stomach and intestines of horses. Fig. 65.



FIG. 65.
Stomach of Horse with Larvæ of Gastrophilus Equi attached to its coat.

Etiology.—They come from the nits or larvæ of the common gadfly of the horse, which may be seen in July and the following warm months busily engaged in laying these eggs upon the hairs at various parts, chiefly, however, about the inside of the knee. The manner in which this fly deposits its eggs is peculiar, and is well illustrated by Fig. 66.

It was formerly supposed that these eggs were licked off by the horse and carried upon the tongue to the mouth, and thence to the stomach, where they were hatched; but it is easy to see that they are so firmly glued to the hairs that this is impossible, and it is also now known that the egg comes to maturity while thus fastened. After a lapse of four or five days, the worm is ready for exit, and then the least application of warmth and friction, as the application of the horse's tongue, is sufficient to cause the eggs to burst and permit the worm to be carried off to the mouth of the animal. Many are, however, crushed in the mastication of food, others may drop out, but enough find their way to the stomach to cause, sometimes, quite serious inconvenience, although usually they do not seem to act injuriously to the health of the horse. Once in the stomach, they fasten themselves to its inner coat by two strong hooks, burying their heads in the mucous membrane, upon which they seem



FIG. 66.
Position of bot-fly in depositing its eggs.

to feed. The maggot remains in the stomach during the autumn, winter, and spring, and in the following June or July, having become full grown, it loosens its hold and is voided with the dung. It then buries itself in the ground, changes into a chrysalis, and after six or seven weeks emerges in its perfect state, ready to continue its round of life.

Treatment.—No treatment is of any use in driving this parasite out; once in its natural home, it stays there in spite of any effort to dislodge it. Well educated men, as well as those more ignorant, will often insist that certain remedies will drive them out, and the poor animal suspected of having bots is tormented with all sorts of worm expellers, and purgative doses. It may be positively asserted, however, that none of them can be of any use, the horse may be killed, and not the bots. Horses which are out at pasture in the summer and fall are chiefly affected by the bot; those kept in stables are rarely troubled by it.



FIG. 67. Ascaris lumbricoides, female.

WORMS.

Etiology.—These are introduced from without in either the food or drink. A low condition of the system, pasturing in marshy or wet ground, or the use of stagnant waters are undoubtedly predisposing causes. Young animals are more subject to them than old ones, and weakly more than the strong. They are, however, often found in horses in which neither of these conditions exists.

Worms derive their nutriment by suction from the intestinal secretions and die if the animal dies.

Three kinds are commonly found in the horse: first, the Ascaris lumbricoides or Megalocephalus, or long round worms, frequently discovered in the dung. They inhabit the small intestines, and are sometimes twelve inches long (Fig. 67). Second, the Oxyuris vermicularis, a small, needle-like, lively worm, found in great numbers in the large intestines and rectum. This worm is usually white in color and about half an inch long (Fig. 68). Third, the Trichocephalus dispar, a slender worm measuring from two to four inches in length, and consisting of a rounded body for half its length, with a contracted, thread-like head. These are found in the large intestines (Fig. 69). Tape worms are occasionally found in young and feeble animals.

Symptoms.—The only certain evidence of worms is their detection in the dung. In many cases, their presence can only be suspected by a peculiar hard, dry, rough appearance of the coat, or at other times by frequent

whisking and rubbing of the tail, and occasionally some dry, white matter may be seen adhering around the anus. Worms may exist for a length of time without presenting any outward appearance which might lead to their detection.

In some cases they injuriously affect the health of the horse, whilst in others they seem to do no harm.

As a general rule, when a horse has worms his system is out of order —possibly not on account of the worms, but perhaps the worms find a



FIG. 68.

Oxyuris vermicularis. *a*, Natural size; *b*, Head, magnified; *c*, Tail, magnified; *d*, Head, more magnified.



FIG. 69.

Male and female Trichocephalus dispar, magnified.

suitable tenement in his intestines because they are out of order, just as the mange insect will lodge in an unhealthy in preference to a healthy skin.

Treatment.—A temporary clearance may be effected by the following:

Spirits of turpentine	℥ ij.
Linseed oil	1 pint.

or as a ball:

Calomel,
Oil of male fern,
Aloes.....ää ʒ i.
Ginger ... ʒ iv.
Linseed meal and molasses.....Sufficient

for one ball.

Gamgee recommends as a sure remedy in cases of Ascaris lumbricoides:

Powdered sulphur..... ℥ xij.
Arsenic..... ʒ i.
Bruised coriander seed ..... ℥ vi.

Make 12 powders and give one daily for twelve days.

A change of diet is always desirable. Salt in the manger is beneficial. Mineral and vegetable tonics are useful in improving the general condition. Worms, however, notwithstanding the temporary clearance effected by medicine, are apt to reappear after a time and should be looked after for a considerable time.

CHAPTER IV.

DISEASES OF THE BRAIN AND NERVOUS SYSTEM.

Encephalitis, Phrenitis, Mad Staggers, Blind Staggers, Sleepy Staggers, Coma, Stomach Staggers, Brain Fever, Megrims, Vertigo, Giddiness, Apoplexy, Chorea, Stringhalt, Tetanus, Trismus, Lockjaw, Paralysis, Palsy, Paraplegia, Hydrophobia, Rabies, Epizootic Cerebro-Spinal Meningitis, Spotted Fever, Putrid Fever, Cold Plague, Sunstroke.

STAGGERS.

Synonyms.—Phrenitis; Encephalitis; Mad staggers; Blind staggers; Sleepy staggers; Coma; Stomach staggers; Brain fever.

Definition.—These diseases may be primarily affections of the brain; they may and frequently do arise from indigestion; they are all symptomatic of inflammation of the brain and its membranes.

Etiology.—Staggers commonly have their origin in some derangement of the organs of digestion; it is probable that it is not so much the engorgement of the stomach as it is the indigestibility of the food eaten which produces this malady. When a horse has fasted any considerable time, food should be given sparingly and gradually, and at first it should be of any easily soluble character, such, for instance, as oatmeal gruel.

All varieties of this affection may also arise from pressure on the brain, such as that which may be occasioned by the formation of a tumor or an abscess on the brain or in the lateral ventricles, or by a tumor in the head pressing on the brain. Such tumors, as they increase, produce gradually augmenting results either of coma or delirium, or of both

at different intervals. Or concussion and pressure, such as that produced by a blow or fall, may bring on similar effects. From such causes the blood-vessels may even give way in the brain, and death may be the immediate result, or sensibility may be lost and a state of perfect coma may ensue.

Sunstroke or the effect of powerful sun and heat, especially on an animal in a plethoric state, may bring on affection, usually comatose, of the brain.

Symptoms.—Williams thus describes the symptoms:—The animal at first appears dull, listless, falls asleep whilst standing, or drowsily nods its head; eats slowly and at intervals; the breathing is generally slower than is natural, sometimes slightly accelerated, but it is always of a somewhat snoring description. The pulse is also slower than natural, from twenty-six to thirty, full and rolling. When made to walk, it has a straggling gait, staggers, and seems as if about to fall. If suddenly disturbed whilst in the somnolent condition, it looks around excitedly, shivers violently, and seems affrighted; but soon becomes calm again, and may remain so for a short period, especially if kept in a dark, quiet place. It now and then thrusts its head against the rack or wall of the stable; moves the limbs automatically; rears, hangs back, and breaks the halter, or gets its forefeet into the manger, and elevates the nose high up into the rack. The eyes, mouth, and rectum are injected, and of a yellow tinge. In some cases, the yellowness of the mucous membranes is a very prominent symptom. As the disease advances, the extremities become alternately hot and cold; sweats bedew the body; there will be twitchings or clonic spasms of the superficial muscles of the neck, breast, and hind quarters. Violent convulsions will now occur; the whole body becoming stiff and rigid, and the respiratory movements extremely difficult. During these spasmodic—tonic—attacks, the tail will be elevated, the membrana nictitans drawn over the eye, as if the animal were suffering from tetanus, and the pulse frequent, hard, and wiry, the eyes fixed and amaurotic, the mouth clammy, and the urine may be ejected by a convulsive effort. All at once the tonic contractions subside, and there will be great muscular debility; the legs bend, the animal totters, sometimes falls, and when down will fight convulsively, and for a time be unable to rise. By slow degrees consciousness to some extent returns; the animal may then regain its feet, and will perhaps commence to feed; then fall asleep, with its mouth full of food, or look about in a wild,

staring, vacant manner, or ramble unconsciously about the box, striking its head against everything that may come in the way, the eyes amaurotic, and the animal quite blind.

Sometimes there is flaccidity or paralysis of the muscles supplied by the cranial nerves, the lips are pendulous, and the tongue hangs out of the mouth. At other times there will be tonic spasms of the facial masticatory muscles, and some degree of trismus present.

The disease may attack the animal whilst at grass in the field. It is then observed to ramble about in an unconscious, drowsy manner, until it meets with some solid objects, against which it fixes its head, and then moves its limbs continuously.

In cases which have been noticed at the commencement of the attack, some degree of rigor has always been observed premonitory to the development of other symptoms.

The above symptoms are subject to some variations. In some animals the comatose and paralytic conditions are the most prominent throughout, whilst in others delirium, convulsions, and spasmodic contractions alternate with the stupor. In other cases, again, the spinal system seems most affected, when paralysis, without loss of consciousness, or with but a slight degree of drowsiness, is present.

There appears to be a general diminution of the various secretions; the costiveness is obstinate; the urine is secreted in small quantities, and is particularly high in color. The function of the liver is also suspended, and the whole system becomes tinged with the non-excreted biliary coloring matter—biliverdine.

As the disease advances, the coma is more profound, or the fits of excitement and frenzy frequent and of shorter duration, leaving the animal more and more enfeebled; the pulse is now small and quick, and the breathing stertorous and difficult; profuse sweats bathe the body, the sphincters relax, the animal is unable to stand, and dies fighting convulsively, or in a state of profound coma. Sometimes the animal throws himself about madly, gets his feet in the manger, tears the rack with his teeth, and breathes stertorously with his eyes apparently staring out of their sockets. The pupils are fully dilated, no light will affect them, nor is the horse sensible of surrounding objects. Some hard dry dung pellets or a small quantity of highly colored urine may be passed. There is spasmodic contraction of the muscles.

Alternately with the violent fits, periods of repose and drowsiness

often occur, and the animal stands exhausted and sweating at every pore with his head bored into a corner. During such intervals the pulse is almost in a state of collapse. The violent fits come on more and more quickly, until the animal is in a continuous struggle, panting and perspiring and the pulse gradually sinking. If the case terminates unfavorably, death generally occurs during one of these intervals, or apoplexy may supervene.

Some people, who had not previously seen the disease, might think that the horse was actually rabid. In true rabies, however, the animal is not merely frantic, but positively and wilfully mischievous, and purposely attacks everything dead or living. This is not the case in mad staggers. There is only furious delirium.

Treatment.—When the comatose attack arises, as it does in the great majority of cases, from indigestion, and especially whilst it is yet in the early stage, nothing answers better than the administration of a large dose of purgative medicine, no cause for uneasiness as to possible superpurgation existing in this disease. Take of

Aloes..... ..... ℥ xij.
Gentian,
Calomel..... .....āā ℥ ij.
Make into two balls with linseed meal and molasses.

If one ball does not have the desired effect after twenty-four or thirty-six hours, give another. Large doses of purgative medicine must be employed, because the bowels are always difficult to move when the brain is affected. An enema of warm water may be thrown up, two or three times. Withhold all food for a day, give very moderately until the trouble is over. Allow plenty of water to drink. Keep the horse quiet and allow no noises about the stable.

Turpentine liniment rubbed all over the legs will arouse the secretions of the skin, and some portion of the turpentine will be absorbed into the system, and will there act beneficially by increasing the action of the kidneys.

When coma arises from other causes than indigestion, medicinal treatment will not be of much avail.

In coma, when it occurs as a primary symptom, the advisability or otherwise of bleeding depends partly on the cause of the affection, and

partly on the stage. In the early stage of partial coma, arising from indigestion, bleeding may be useful, inasmuch as by reducing the general volume of the blood, it will relieve the fulness of the vessels of the brain. The quantity abstracted should not be large, not over two or three quarts, but the blood must be drawn quickly. If we cause the strength to fail, we shall not be able to bring back the stomach and bowels to their normal action. If the coma arises from concussion of the brain, blood may be freely drawn, say five to six quarts. If, however, it be due to the formation of a tumor on the brain or such like cause, bleeding is clearly useless and so indeed is all treatment. When the comatose state, whatever may have been the cause, has lasted for some time, bleeding is obviously inadmissible. The patient is in far too reduced a state to admit of such a depleting measure.

In mad staggers the same course of treatment as has been recommended for the comatose phase is desirable and should be applied, as far as circumstances may admit in any particular case. But except in the very early stage or in mild attacks it is generally almost impossible to apply those remedies on account of the violence of the animal.

As soon as decided signs of frenzy appear, whether as a primary symptom or supervening on coma, copious bleeding (whatever may have been the cause of the attack) is the appropriate remedy. The blood should be allowed to flow irrespective of quantity. On the authority of Prof. Williams, it may be four, five, six, or even eight quarts, but other writers do not recommend such large quantities. There is often, however, great difficulty and risk to the operator in applying this remedy, and indeed in some cases of frantic delirium it is impossible to approach the patient. If it be not possible to open the jugular vein, it may be possible to cut the temporal artery. This class of affections of the brain yield more readily to the influence of blood-letting than to any other remedy. If we cannot very quickly abate the phrenitic symptoms, the patient will die.

As topical relief, both in the comatose and also in the mad stages (if possible), cold wet cloths should be constantly applied to the head, and a stream of cold water should be poured on them from above.

Blisters to the head and neck are not advisable during the acute symptoms, whether comatose or phrenitic, as they tend to increase the derangement. But when the attack seems to become chronic, they may be beneficially applied, or a seton may be inserted. The latter generally

answers best. In all cases the patient should be placed in a cool, airy, darkened box.

The duration of the comatose state is very uncertain. When arising from indigestion, it will probably be over, in favorable cases, in twenty-four hours; or it will run on into mad staggers with occasional intervals of coma. A decided change for better or worse will probably take place in from one to three days. When the coma arises from a tumor or abscess on the brain, or from a tumor in the head pressing on the brain, the case may last for weeks or months if the animal be allowed to live so long. In such cases it is a mercy to shoot the horse and put him out of his misery. In concussion of the brain the comatose symptoms may last a considerable time, but the patient will not long survive repeated attacks of a violent pain.

In mad staggers, encephalitis, phrenitis, or brain fever, from whatever cause proceeding, the exhaustion produced by the violence of the disease will probably cause the animal to sink in a few days, unless relief is obtained.

Therefore, when the disease has taken a favorable turn and the patient is recovering, most careful attention must be paid to the diet, to good nursing, fresh air, and the administration of tonics, as:

Iodide of potassium,
Nux vomica.....āā ʒ i.

Given in the animal's food twice daily for a time. The regular action of the bowels should be established, and tonics will be found of advantage in bringing up the general tone of the animal. The following may be used:

Sulphate of iron.....℥ ss.
Gentian.....ʒ ij.
Make into a ball.

The feeding should be liberal and of good quality. The strength of the patient is always greatly reduced by the attack, if severe, and especially if prolonged.

MEGRIMS.

Synonyms.—Vertigo; Giddiness.

Definition.—Vertigo, more commonly called megrims, is an affection

of the brain, but the nature of the disease is not well understood. By some veterinarians it has been defined to be a momentary and passing congestion of the brain.

Etiology.—High feeding with occasional overwork. Collars which fit badly and press on the veins which convey the blood from the head. Intervals of overstrain on hot muggy days, and tight checking up, seem somehow to have an influence in producing it. Indigestion and constipation, worms and hereditary tendency are among the causes of megrims.

Symptoms.—The attack is very sudden and peculiar. There are seldom any premonitory symptoms. The animal suddenly shakes and throws up his head, or shakes it violently or reels and then stands for a minute or two dull and listless, or runs round, and falls to the ground, remaining for a few moments partially insensible or in a state of violent convulsion. The attack rapidly passes away, the horse rises in a minute or two, shakes himself and proceeds as if nothing had happened, though perhaps he may appear somewhat debilitated. During the fit his urine or dung may escape from him involuntarily. The attacks are usually periodical, and occur chiefly during hot weather and at severe harness work.

There is seldom any outward sign which indicates liability to this disease. On the contrary, the horse generally looks well, has a good appetite, and shows no special nervousness or dulness.

Treatment.—If the attack comes on while driving, stop immediately and loosen the check rein, the throat latch, and the collar. If after standing a minute or so the excitement continues, take the harness all off and pour cold water on his head. After the attack is over, lead the horse home and put him into a loose box, feed him bran mashes and give plenty of water to drink. A purgative will be of service. Take of

Aloes..... ....3 iv. to 3 vi.
Ground ginger..... ....3 ij.
Molasses..... ....sufficient
To form one ball.

As a preventive, keep the animal in fair, not high condition, and in regular work, with diet sufficiently laxative to insure his bowels being moderately open.

An overloaded or deranged state of the bowels is apt to affect injuriously the functions of the brain.

A piece of wet sponge secured on the head and along the forehead, or a shade over the eyes, especially in sunny weather, will sometimes prevent attacks. In lieu of a collar for harness work, a breast band should be substituted, and the check rein abolished.

A megrimed horse, however, is not to be depended on, certainly not in harness. The attacks may perhaps be warded off by careful attention to diet, regular work, and occasional physic; but sultry weather, hot sun, or hard work may cause a recurrence of the attack. It is an incurable disease.

APOPLEXY.

Synonym.—Cerebral Hæmorrhage.

Horses are sometimes struck down by apoplexy as by a blow, and lose all sense and power of motion, and death quickly ends the scene. Post-mortem examination often reveals a congested state of the vessels of the brain and its meninges. In horses, apoplexy is almost always due to rupture of degenerated blood-vessels. There may be some premonitory symptoms, such as staggering and partial paralysis, but generally the animal falls suddenly without warning. After falling it may lie prostrate, in a state of unconsciousness, without the power of voluntary motion, perfectly insensible to surrounding objects, and dead to all ordinary feelings, with its eyes wide open and presenting a ghastly stare, the pupils dilated and insensitive to the light—amaurotic. The breathing is stertorous, the pulse small, rapid, and thready, the surface of the body cold, or bedewed with a cold sweat, the limbs flaccid, the mouth open, and filled with frothy saliva, and in some severe cases the sphincters are relaxed. In other instances the animal may still retain the power of muscular movements; but they are irregular, and intermixed with spasmodic contractions. Whilst down, it fights convulsively, presses the back of its head violently against the wall or other solid body. Some degree of opisthotonos is present, the back is arched downward, and the hind legs extended backward. The eyes move about convulsively, or there may be persistent strabismus of one or both of them; the pupils may be dilated or contracted, alternately contracted and dilated, or they may be natural, or one may be contracted, and the other natural or even dilated. The respiratory movements are sometimes spasmodic; now and then there may be a stertorous sound; at other times sighing, and sometimes

expressions of great pain, as if the animal had been sharply wounded with a cutting instrument.

These symptoms may alternate with intervals of quietude, when the animal will fall into the comatose condition. The pulse may then fall below its natural standard, and the respiratory movements may become slower than natural, with heavy, deep inspirations. The various secretions are, in all cases, suspended, and the animal gradually sinks from increasing brain pressure, or suddenly from renewed extravasation.

Apoplexy differs from coma and encephalitis in rendering the animal totally unconscious. If relief is obtained, which, however, is rare, the case usually resolves itself into a state of partial coma, more or less intense.

CHOREA.

Synonym.—Stringhalt.

Definition.—A convulsive, involuntary twitch of the muscles which flex the leg, by which the foot is pulled up with a sudden jerk and higher than natural, and replaced with considerable force.

Etiology.—It is due to some affection of the nerves which is not yet clearly understood.

In some cases it may be traced to the pressure of some bony growth on a nerve; but as a general rule we are unable to account for the affection, nor do post-mortem examinations always show any abnormal state of the nerves.

The disease varies very much in degree or intensity in various cases, but most generally affects both hind legs and becomes worse with age. It is occasionally noticed in the foreleg.

In the early stage it is most easily detected, when the animal is first put in motion.

Sometimes the horse will take a number of steps without showing any evidence of it, and then the foot will be suddenly jerked from the ground; so, too, he will sometimes exhibit signs of the disease only in turning round from right to left or vice versa, the unnatural gait not always accompanying both motions.

No treatment produces any beneficial effect.

TETANUS.

Synonyms.—Lockjaw; Trismus.

Definition.—Tetanus is a persistent contraction without any relaxation or alternation of the voluntary muscles; when the affection is confined to the jaws, it is termed trismus.

Etiology.—The immediate cause of tetanus is some abnormal condition of the nerves and their peripheral centres. A part of the brain, and the spinal cord in particular, either partially or throughout, is involved.

Tetanus is most commonly induced by picking up rusty nails or other bits of iron, causing an injury to the sensitive portion of the foot.

It also follows, at times, surgical operations; docking has been known to induce it in a number of instances. The influence of local circumstances and meteorological conditions are recognized in causing a tendency to tetanus.

Why, or under what circumstances injury to the end of a nerve will produce this terrible disease, is, as yet, wholly inexplicable. Tetanus resulting from any such cause is termed "traumatic."

It also arises not infrequently from any sudden chill to the back or loins, such as that caused by a horse being left to stand in a draught whilst sweating, especially if the saddle has been removed. When there is no external or at least no perceptible external injury, the disease is termed "idiopathic."

When the muscles of the face and jaws alone are affected it is termed "Trismus."

Symptoms.—The attack is characterized by more or less closure of the jaws, sometimes the teeth are firmly fixed together, great difficulty in swallowing, rigidity of the limbs and extreme difficulty in moving. The animal also pokes out his nose, as if suffering from sore throat. As the disease advances, the jaws become so tightly locked that neither food nor medicine can be introduced through them.

Within three or four days and sometimes earlier, the symptoms reach their height. The ears are erect and turned forward, the eyes are retracted, and the haw is partially protruded over them, Fig. 70. The nostrils are dilated. The animal stands persistently, his legs are stretched wide apart and look more like wooden stilts than living structures. The tail is upraised, the

belly is tense and tucked up, and the muscles everywhere stand out prominent and rigid.

The voluntary muscles of the internal structures are similarly affected. The involuntary muscles of the intestines, on the other hand, are torpid, because the nervous force seems to be monopolized in the voluntary muscles. Hence arise the obstinate constipation and torpidity of the urinary bladder which usually form so marked a feature in this disease.

Notwithstanding the intense contraction and rigidity of the muscles, the patient is highly sensitive and shrinks from the slightest touch or approach to a touch. He sweats profusely and groans from pain. A very marked symptom of the disease consists in rapid protrusion of the haw over the eye, if the horse is touched under the chin, or if his head is elevated.



FIG. 70.

Protrusion of the haw over the eye on elevation of the nose, characteristic of tetanus.

Death, unless the symptoms are relieved, generally occurs in from two to twelve days.

Tetanus, in some cases, by seizing at once or almost at once on some vital organ, such as the heart, may produce death very speedily, with scarcely any outward symptoms except great pain and rapidly increasing prostration.

Treatment.—The disease lies in that part of the nervous system which controls the voluntary muscles; and consists in rigidity, not in in-

flammation of the muscles. It is said post-mortem examinations have shown that the nerves leading from the injured parts present some signs of inflammation.

Bleeding, aconite, opium, and such reducing remedies seldom have any good effect. Blisters applied down the line of the spine likewise do harm, inasmuch as they increase the general irritability, and tendency to spasms.

The exciting cause should be sought for. If it is a wound of the foot, the offending substance must be removed and the opening enlarged to give free passage for the pus which has accumulated and will do so. It is good practice to pare down the sole of the hoof quite thin about the hole, in order to render it still easier for the pus to escape. Apply a poultice of :

Ground flaxseed,
Warm water..... .....ãã sufficient.

Laudanum or belladonna may be added to this poultice with advantage.

The medicinal agents that have been used in the treatment of tetanus are numerous: purgatives, opium, tobacco, Calabar bean, woorara, prussic acid, calomel, chloroform, belladonna, hyoscyamus, cannabis indica, arsenic, chloral hydrate, etc. It is considered advisable to give at first a purgative if it can be done ithout exciting the horse.

Powdered aloes..... ..... ℥ vi.
Ground flaxseed,
Molasses .....ãã sufficient
To make one ball.

If the animal shows symptoms of excitement give

Extract belladonna..... ..... ℥ iv.

This may be smeared on the animal's teeth or tongue and will be licked off and swallowed.

The calabar bean, given in doses of two to four ounces of the tincture, has a most wonderful effect upon the spasms, the pulse, and the breathing; but this effect is very transient, and is succeeded by a return of the spasms with great severity. The seat of the wound is from time to time

to be smeared with the extract of belladonna; and when the belladonna is administered internally, it should be either dissolved in the animal's mash or drink or else placed between his teeth, allowance being made for the probable waste.

Perfect rest and quiet are the great desiderata in treatment. The patient should be placed in a loose box and the light darkened, and no one except his regular attendant should be allowed to enter. Even he should go in as seldom as possible. Any excitement invariably increases the spasms. The skin of a newly flayed sheep may be placed over the loins, and the patient must be kept warm by extra clothing and bandages. In some instances, however, the skin of the sheep will cause irritation, and even the weight of the clothing may have this effect. If this should be found to be the case, the animal had better be left without clothing; or a very light sheet may be worn. Again, in many cases the straw will cause irritation, and, if so, tan or sawdust may be substituted for it. Keep a pail of water in which a couple of handfuls of oatmeal has been stirred up, constantly in the loose box, so that the horse can have it whenever he feels the least desire to drink. It is well also to put a bran mash, with

Extract of belladonna..... ʒ ij.

in it, in the manger twice daily. If it is not eaten, clean it out and put in a fresh one at the proper time. If the horse will sip it at all, it is even better to mix it with milk instead of water.

Some recommend putting the horse in slings as soon as the disease is pronounced, and in cases which progress rapidly it is well to do so, since, if the animal falls, he will excite and strain himself terribly in his efforts to rise.

The prospect of recovery is not usually good. A young well-nourished animal is far more likely to get well than an old exhausted horse.

PARALYSIS.

Synonyms.—Palsy; Paraplegia.

Definition.—More or less complete loss of voluntary motion, accompanied in some cases by insensibility in the parts affected.

Etiology.—Commonly partial paralysis or palsy in the horse arises from indigestion, constipation, injuries to the spinal cord from violence, fractures, etc., and in mares from uterine irritation also.

Symptoms.—When resulting from injuries, the paralysis usually includes those parts of the body supplied with nerves from the neighborhood of the injury, and comes on almost at once, the loss of power being quite evident. When caused by colic, the approach of the attack is more gradual, begining with the hind legs knuckling at the fetlock, and eventually the loss of power is so great that the animal falls upon his haunches. After a time, the violence of the attack will pass away, leaving its effects in weak limbs and tottering gait which may require a number of days before it disappears.

Treatment.—When the spinal cord is affected, no treatment will do any good. If the paralysis is reflex, the cause should be removed. When due to indigestion, give at once:

Powdered aloes..... ℥ vi.
Calomel..... ℥ i.
Make into a ball with linseed meal or bran, and molasses.

Apply cloths wrung out in hot water to the loins, and renew often enough to keep warm.

If the paralysis is persistent, give:

Extr. nux vomica,
Iodide of potassium..... āā ℥ i.

This may be given in the drinking water, or with the animal's food, twice a day; discontinue as soon as involuntary twitchings show themselves in the muscles.

The use of a mild blister along the spinal cord and over the loins is recommended, for which purpose the best is:

Biniodide of mercury..... 1 part
Lard..... .....16 parts

As tonic, to be given during recovery, iron is especially useful:

Sulphate of iron..... ℥ i.
Powdered gentian..... ℥ iv.
Mix with the food and give daily.

HYDROPHOBIA.

Synonym.—Rabies.

This disease is considered to originate nearly always with dogs, but seldom with the feline race.

Etiology.—In the horse, always the bite of an infected animal.

Symptoms.—The disease is manifested in a variety of ways. In some cases it commences by great apparent distress, with sudden perspirations over the body; unruliness, the horse stamping and pawing violently, finally becoming frantic, and destroying everything within its reach. In other cases, along with restlessness, there is manifested a desire to bite the seat of injury.

In the stallion and mare it is stated that the sexual desire is augmented; that the stallion has frequent erections, and neighs in a harsh tone, and the mare stands with her hind legs apart, showing signs of œstrum.

Treatment.—Can only be preventive. Shave off the hair about the injured part, so as to surely find any scratch, and cauterize the wounds with nitrate of silver. If the wounds are deep, they should be freely excised before the application of the caustic. It is not every horse bitten by a rabid animal to which the disease is communicated, and while it requires only a few weeks in some cases for the symptoms to show themselves, it may be several months, and perhaps it may never appear. It is, therefore, best to keep a bitten horse quiet for a month or two after he has received the suspected injuries. Place him in a loose box, feed him well, but moderately, and give him gentle exercise. If the symptoms appear, the horse should be shot without unnecessary delay, both to save him from intense suffering and to avoid any injury he might do to his surroundings in his spasms of frenzy. There is no cure for the disease.

EPIZOOTIC CEREBRO-SPINAL MENINGITIS.

Synonyms.—Spotted fever; Putrid fever; Cold plague.

Definition.—This form of disease is characterized by inflammation of the membranes and surface of the brain and spinal cord. It is an epidemic non-contagious disease, and is usually very malignant.

Etiology.—The causes are not clearly settled, but the disease is supposed to be due to a specific poison existing in the air. Well-fed and high-bred animals are quite as often attacked as others.

Symptoms.—The symptoms may approach gradually, and this is by far the less fatal form. The horse will at first be noticed to be dull and have a staggering gait, with more and more paralysis, usually of the hind extremities. This extends over from one to three days, when the coma, generally not deep, comes on. The animal is comparatively easily roused, and unless a relapse occurs, the case almost always does well, as far as the acute attack is concerned, but the paralysis which follows this form is, in old horses, apt to be obstinate. Relapse may occur at any time during the first six or eight days, or even later, and may prove fatal to a case which seems to be doing nicely.

Occasionally the horse is seized with all the suddenness of a spasm. The muscles of the neck, but especially those of the hind quarters, become corded, fixed, and rigid, and soon grow deathly cold to the touch. This tetanic state of the muscles may last some hours, giving way finally to flaccidity of the whole muscular system, complete anæsthesia, coma, and death in from twelve to seventy-two hours. Secondly, and this is the most common form in which the disease appears, there are premonitory signs, such as rigors, dulness of the eyes, and lassitude of the whole system; followed in from three hours to as many days by paralysis, general or partial, more commonly the latter, generally affecting the muscles of the loins and hind extremities, more or less coma accompanying this stage. In some few cases delirium has ensued. The patient is frantic, beating its head against the wall or floor, as the case may be, with great violence, uttering the most horrible cries, and soon dying in great agony. In such cases recovery is so rare that it is best to destroy the animal.

The pulse during the first few days is not materially altered.

Temperature of the surface of the body is lower than in health.

The bowels are generally constipated, but may be unaffected or even loose, and in rare cases the fæces may be passed involuntarily. This is said never to be seen except in fatal cases, and within twelve or fifteen hours of death.

The urine in appearance is generally normal, and passed without difficulty; indeed, incontinence is not uncommon, especially in mares. It may be retained from paralysis, in which case it is, when drawn,

found to be of a dark color, offensive and ropy, due to the rapid decomposition of urea, caused by unhealthy secretions from the walls of the bladder. I have met with one or two cases in geldings in which priapism was present; and in mares signs of œstrum are almost always apparent, with intense congestion of the mucous membrane of the vagina.

The breathing is more or less stertorous, seeming to depend upon the depth of the coma.

In the diagnosis, this fever should never be confounded with spinal meningitis or acute paralysis, which occurs at all times of the year, and in isolated cases, presenting much the same symptoms as the fever; but it is not so malignant, and approaches much more gradually, and, except in cases arising from mechanical injury, generally follows some other disease, such as rheumatism, purpura hæmorrhagia, severe influenza, etc. It is indicate dby rapid prostration, followed by paralysis with usual but not constant constipation. The pulse and temperature are not guides during the early stages.

The prognosis should in all cases be guarded, but the more rapidly the disease develops itself, the more reason have we to dread its results. The malady progressing, the unfavorable symptoms are, deep coma, abnormally slow pulse, cold extremities, and labored breathing.

Treatment.—The supply of blood to the spinal cord is undoubtedly too great, and must be lessened; but this cannot be safely accomplished by bleeding in these cases. The first thing is, if possible, to raise the patient, and put it into a comfortable sling, or if it be unconscious, so that this is impossible, make a large thick bed of straw, place the patient on it, and see that it is carefully rubbed and turned as often as every two hours. This must be strictly attended to, for the position of the animal, as well as the disease, tends to improper circulation of the blood, from which nothing but bad results can be expected. Unless the patient is slung within twenty-four hours from time of attack, there is but slight hope for a recovery. Having got it into the sling, the treatment is (if the horse will bear it without showing signs of irritation) to have it well rubbed down with a brush, especially about the extremities; it must be well clothed, and its legs dry bandaged with flannel cloths. The appetite, if the horse is conscious, is generally good. It should be allowed a fair quantity of good soft food, such as boiled oats, carrots, etc., and a small quantity of hay; remembering always that the bowels are apt to be

costive, and that it is better for the patient if they can be regulated without physic.

As to the medical treatment, there is a great diversity of opinion amongst practitioners as to what is the right mode. Some bleed and purge, generally with bad results; others blister the spine anterior to the seat of inflammation (as indicated by pressure), with a mixture of turpentine and mustard, with the idea that the disease is on a march from the brain, and that this will put an effective barrier in its path. Belladonna, colchicum, sal ammoniac, carbonate of ammonia, and many other substances, have been used with better or worse results. The use of atropine, injected subcutaneously :

Sulphate of atropine ....m v.

Or, in place of this, take of

Belladonna..... ʒ iij.
Ergot..... ʒ i.
Make into a ball, and give one, two or three times a day,

to be followed by stimulants and tonics during convalescence, but the stimulants must be used cautiously at first.

Whatever treatment is adopted, the aim should be to reduce the supply of blood to the cord, and keep the general circulation in as normal a condition as possible, at the same time keeping up the animal strength as much as we are able. If, after two or three days, the bowels continue costive, and do not respond to an enema, a physic ball :

Aloes..... ... ʒ vi.
Ginger..... ..... ʒ ij.
Molasses..... .....sufficient

may be given.

EPILEPSY.

Synonym.—Fits.

Definition.—A disease of the nervous system, characterized by sudden convulsions ; not very common in the horse.

Etiology.—Not as yet satisfactorily demonstrated.

Symptoms.—The premonitory signs of epilepsy in the horse are not easily recognized or detected. The first indications we usually have of an attack is a staggering gait, a champing and grinding of the teeth, rapidly followed by loss of consciousness, and falling to the ground in convulsions.

Treatment.—The treatment during an attack consists in giving plenty of fresh air, and in dashing cold water over the head. In the intervals between attacks, it is well to clear out the bowels by a purge, and unless contra-indicated, to treat for worms; give:

Oil of turpentine..... ℥ ij.
Linseed oil..... ℥ x.

or,

Calomel,
Oil of male fern,
Aloes.....āā ʒ i.
Ginger..... ʒ iv.
Linseed meal,
Molasses.....āā sufficient.
Make one ball,

to be followed in a day or two by

Linseed oil..... .....1 pint.

Or if it is easier to administer a ball, give:

Aloes..... ʒ vi.
Gentian..... ʒ ij.
Linseed meal.....sufficient.
Make one ball with molasses.

Or the following is a still better purge in these cases:

Sulphate of iron ..... ℥ i.
Aloes..... ʒ iv.
Linseed meal.....sufficient.
Make one ball with molasses.

SUNSTROKE.

Synonyms.—Thermal fever.

Definition.—An affection of the brain induced by excessive heat, and particularly by exposure to the direct rays of the sun; it is usually accompanied by more or less complete loss of consciousness.

Etiology.—Overwork in hot weather, with exposure to the sun.

Symptoms.—Slowing up in his work with a staggering gait. The horse spreads his legs, hangs his head, breathes fast and loudly; the nostrils are dilated and in rapid motion. If the attack is severe, the animal falls and dies in a convulsion.

Treatment.—Dash cold water, the colder the better, upon his head and all parts of the body; blood-letting will do injury and medicines are of no use. After the attack, throw the horse up from work for a week or two, if possible; give him good food and plenty of water and fresh air.

CHAPTER V.

DISEASES OF THE EYE.

The Membrana nictitans, Simple Ophthalmia, Conjuntivitis, Inflammation of the Conjunctiva, Specific Ophthalmia, Periodic Ophthalmia, Moon Blindness, Cataract, Lenticular Cataract, Capsular Cataract, Interstitial Cataract, Spurious Cataract, Amaurosis, Glass Eye, Gutta Serena, Glaucoma, Lacerations of the Eyelids, Disease of the Lachrymal Passages, Foreign Bodies in the Eye, Worms in the Eye.

A very marked peculiarity of the eye in the horse is what is called the Membrana nictitans or Haw, which is situated in the inner corner of the eye. The haw has two principal uses: first, by moving backwards and forwards it wipes off the dust or other extraneous particles which may lodge on the surface of the eye; and secondly, by protruding forward, when the eye is drawn back on the approach of danger, it guards the cornea, to a certain degree, from any accidental blow. Its motion may be said to be involuntary, because it is forced over the eye mainly by the withdrawal of that organ into its socket.

This peculiarity of structure renders it very difficult to perform on the eye of the horse many of those delicate operations which are so useful in human surgery for the relief of various ocular diseases. With some trouble, however, the eye may be got at. It is necessary, in the first instance, to catch and retain the haw by a hook. The operator must frequently touch, or threaten to touch, the eye; and though for some time it will be drawn back at each threat, yet at last the retractor muscle will be wearied out, and certain operations may then be performed. This practice is adopted with success in India in cases of worm in the eye. Of late years, chloroform has been used in operations on the eye. The

horse has also a peculiar power of withdrawing the eye into its orbit, which adds to the difficulty of performing operations upon it.

SIMPLE OR COMMON OPHTHALMIA.

Synonyms.—Conjunctivitis; Inflammation of the conjunctiva.

Definition.—An inflammation of the membrane which covers the surface of the eye, and lines the eyelids.

Etiology.—It usually has its origin in some casual injury, as a blow of some sort, or some foreign substance getting into the eye. It may also accompany influenza.

Atmospheric causes are an occasional, but not very common source of this disease.

Symptoms.—Closing of the eye, accompanied by a profusion of tears. General suffusion and redness about the cornea. Unless the seat of injury is wholly external and therefore at once apparent, the eye should be examined. Here, however, we at once meet with some difficulty. The animal closes his eyelids firmly. He is impatient to light. As soon as we attempt to separate the lids, he withdraws his eye into the socket, and the haw is thereby pushed forward, and the tears flow profusely. A sharp rap of the hand on the neck will sometimes cause the animal to open his eye, and an opportunity to examine it will then be afforded. If this device fails, the hand should be laid steadily on the brow, with the thumb resting on the margin of the upper lid; the thumb must be kept quietly and firmly on the lid, until the retractor muscle ceases to act violently, and then the lid should be gently pushed upward, and the index finger of the other hand may at the same time draw down the lower lid.

A disturbed state of the blood-vessels and a reddened hue of the conjunctival membrane will probably be noticed. Possibly, on further examination, we may detect a wound of the cornea, such as that inflicted by a whip or by a bite from another horse. If, however, there is no such wound, the chances are that some foreign body, such as a hayseed, has lodged on the eye. The seat of such lodgment *is generally under the upper eyelid.* In such cases, the removal of the foreign body is, of course, the primary requisite. The upper eyelid is easily everted, with a little tact, by pressing against it outer surface with the blunt end of a lead

pencil or some such instrument, and turning the margin of the eyelid upward and inward at the same time. Foreign bodies seldom lodge on the cornea, because the action of the haw, aided by the flow of tears which are at once effused, speedily carries them away.

Although blows over the eye, or upon it, are not usually productive of dangerous symptoms, yet we occasionally find disastrous results. Concussion of the retina may take place from the effect of a violent blow on the eye, and may be followed by temporary or permanent blindness. Again, the humors of the eye may be lost; or the rupture may be internal, and we may then have an escape of blood into the anterior chamber of the eye; or the ciliary margin of the iris may lose its connection, and may afterward, by process of adhesive inflammation, become attached to some adjacent structure; or there may be displacement of the crystalline lens, which may be driven into the vitreous humor; or it may fall forward into the anterior chamber. When the blow is so violent that the cornea is lacerated and penetrated, there is no chance of a cure, because the retractor-oculi muscle acts so strongly that the lens is usually forced out.

Simple ophthalmia often accompanies catarrh and influenza and also dentition. In these cases, however, the affection is only sympathetic, and subsides with the cause. The inflammation of the membrane is only an extension of the inflammation previously existing in the neighboring mucous membrane of the nose or gums.

Inflammation of the conjunctiva seldom appears as a separate disease. When it cannot be traced either to some external injury or to sympathy with a previously existing affection, such as catarrh or influenza, it should be looked upon with great suspicion, lest it should be the prelude of specific ophthalmia

In simple ophthalmia, the cornea, from the effect of the inflammation, often has a bluish tint which is peculiar to this form of ophthalmia, and which distinguishes it from periodic ophthalmia; but in other cases it remains clear and bright. The size of the pupil, it is to be particularly remarked, is seldom diminished, whilst in the specific disease this symptom is always present. Again, in simple ophthalmia there is a state of general suffusion and redness about the cornea, whilst in the specific disease the vessels which traverse the palpebral portion of the conjunctival membrane investing the cornea take a circular direction round it, with ramifications proceeding toward its centre.

Treatment.—The treatment of simple ophthalmia, when it arises

from slight external injuries, is simple. First ascertain that there is no foreign body causing the irritation. In making this examination, proceed as just directed; do not expect to find some large substance; look for a minute speck which will be much more likely to reward the examination. If seen and quite small, touch it with a fold of dry cloth, and it will probably adhere and come off on it. If larger, it may be removed by brushing with a feather, or picked off with a pair of forceps. If no offending body can be discovered, the inflammation must be treated differently. The patient should be placed in a diminished light, and his head should be tied up to the rack. In the early stage, fomentations of warm water are desirable; but as soon as the active inflammation has subsided, cold-water dressings should be substituted, because the parts need bracing up, in order to restore their healthy tone. If the eye remains weak, it may be bathed with:

Sulphate of zinc..... gr. iij,
Water..... ʒi.

or,

Powdered alum..... .....gr. vi.
Water..... ʒi.

For more severe injuries, little more can oe done than to place nature in the most favorable condition to exert her restorative powers. Advantage may be derived from smearing the skin of the eyebrows and lids with:

Extract of belladonna..... ʒi.
Simple syrup..... ʒss.

Salts of lead should never be used, as they are liable to cause opacity of the cornea.

The treatment of the external laceration or injury, as distinct from its effect on the eye, is the same as that of any other laceration or injury.

Any very severe injury of the cornea or parts in its neighborhood, whether arising from a blow or from irritation produced by a foreign body, occasionally results in partial or even in complete, though generally only temporary, opacity of that structure. The deposit is indicated by

a white fleecy appearance, and is usually situated between the conjunctival membrane and the cornea, or in severe cases between the layers of the cornea.

Under favorable circumstances, the deposit will be removed in time by the ordinary operations of nature, but in aggravated cases it will probably be in some degree permanent.

For simple ophthalmia connected with catarrh and influenza, no treatment is necessary beyond cooling lotions, as

Chloride of ammonium,
Nitrate of potash..... .....āā ℥ iiss.
Water..... .....1 pint.

Wet a rag in this and hang it over the affected eye, and darken the stable. The disease is only sympathetic and usually subsides with the primary affection.

SPECIFIC OPHTHALMIA.

Synonyms.—Periodic opthalmia; Moon blindness.

Specific ophthalmia is a rare disease, and is considered a constitutional affection. It is an inflammation of the internal structure of the eye.

Etiology.—Usually supposed to be malarial. Stables in which the horse is habitually in almost total darkness and which are almost of necessity foul stables. It is considered by some, including Percival, to be caused sometimes by hereditary predisposition.

In the very early stage, many of the symptoms are the same as those of common ophthalmia. If, however, on examination we can discover no sufficient cause for the closing of the eye, such as an external wound or a catarrhal affection, there is always some reason to fear that the attack may be the specific disease. As the treatment in the early stage is the same in either case, we may wait patiently for the development of further symptoms.

Symptoms.—Sometimes the disease comes on slowly, but more commonly appears suddenly and gains ground rapidly. There is turgescence of the lids, a flow of tears, intolerance of light, a slightly inflamed state of the conjunctiva at the outer margin of the cornea. As these symp-

toms increase, the eye sinks somewhat in its socket, and at the same tin the haw is brought partly forward over the eye. Then, there is a gre redness of the conjunctival membrane, and blood-vessels appear in i some of them running in a circular direction and others radiating to central point; there is also general dimness of the surface, and a cop ous flow of hot tears. These symptoms will soon be followed by th aqueous humor appearing thick and muddy, and the iris losing its brill ancy. In very acute cases, there soon occurs a deposit of lymph, ofte tinged with blood, which fills up the anterior chamber of the eye, s that the state of the interior can no longer be seen.

When improvement is about to take place, the curtain of lymp gradually falls down from the superior border of the anterior chambe if it has been attached there, and we are then enabled to see what mi chief has been going on within the eye. These changes, both for bett and for worse, take place in a remarkably short space of time.

We may find even after the first attack that the iris is adherent to th capsule of the lens, or that cataract has commenced to form in the le or in its capsule. But these marked effects do not usually appear unt after several attacks. More generally we find no other trace of the attac than that the iris has lost in a very slight degree the brilliancy of its colo the lens a little of its clearness, and that the pupil of the eye attacked somewhat smaller than that of the other. A little opacity, varying mo or less according to the virulence of the attack, is also left in the corne particularly round its margins. The iris also does not act quite so freely i the diseased as in the other eye, and hence the pupil is not kept quite s dilated as it ought to be. All these effects are due to the fact the pr ducts of inflammation have not been completely absorbed and carried awa In a first attack, the animal usually recovers quickly, after the disea begins to abate.

The period of intermission between the first and second attacks varie from three weeks to three months or longer; but succeeding attack often follow more rapidly, until the sight is destroyed by the formatio of a cataract.

Treatment.—No reliable means of preventing a recurrence of the at tack is known, but still nothing which can give relief should be neglected The patient should be placed in a cool, well ventilated loose box, and diminished light only should be admitted; the body should be kept warm by clothing, a linen shade kept constantly wet should be applied over th

eyes, as the organ is extremely intolerant of light; and the head should be maintained in a somewhat elevated position, in order to facilitate the return of blood from the inflamed vessels.

When the attack is an isolated one, a diligent search should be made for the causes which may have induced it; and any such causes, if discovered, should, if possible, be removed or reversed. Thus, if the horse is fat and in high condition, depletives may be beneficial; whilst, on the other hand, if the animal is low, good feeding and tonics will be appropriate. As a tonic the following is recommended by some:

Powdered Peruvian bark	℥ ss.
Sulphate of iron	ʒ i.

to be given twice or three times a day. In most cases, however, specific ophthalmia, in spite of all treatment, runs its course, sometimes unobtrusively and with scarcely noticeable force, and at other times with acute symptoms.

CATARACT.

Cataracts are divided into true and spurious. The seat of true cataract is in the crystalline lens, in its capsule, or in both, or even between the lens and its capsule. Any opacity in the lens must seriously interfere with the vision. So likewise, though in a lesser degree, any opacity in the capsule or between the capsule and the lens will affect the power of sight. There are three classes of true cataract distinguished as to name by the position they occupy, namely, Lenticular, Capsular, and Capsulo-lenticular or interstitial.

The color of a cataract depends on various circumstances and especially on the length of time that has elapsed since its formation. In the very early stage the lens may show only a slight nebulosity; later there may be seen in it streaky lines radiating to a centre, and at last cataract may be fully developed as a circumscribed white spot gradually increasing in size.

In rare cases a portion of the capsule of the lens may be partially clouded, as a result of any injury or blow on the eye. Such cloudiness is usually only temporary, though sometimes it may be persistent.

Etiology.—As a general rule, after several attacks of ophthalmia the

pupil dilates and clears, and cataract forms. But in special cases the pupil may remain constantly contracted, because adhesion has taken place between the capsule of the lens and the iris; or, on the other hand, the pupil may remain abnormally open, if there is paralysis of the optic nerve or a tendency to amaurosis. In such a case the eye is more tolerant of light, because less susceptible of its effect.

Lenticular cataract, or in other words partial or complete opacity of the lens, is the result of the deposits left by the repeated attacks of inflammation. The effusion is at first interspersed through the substance of the lens, but gradually, as the more watery parts of the effusion are taken up, the deposit concentrates to one spot and forms the opaque speck known as cataract. Cataracts are generally of very gradual formation. The first attack of inflammation, though it probably leaves some, yet generally gives rise to no perceptible deposit or opacity; but after several attacks the deposit or speck becomes apparent.

In old horses similar changes sometimes go on insensibly, ending in cataract without any perceptible periodical attacks of inflammation.

Capsular cataract proceeds from the same causes and is formed in much the same way as lenticular; but for some reason not very easy to explain, the deposit fixes itself on the inner surface of the capsule instead of in the lens. If the lens be examined by a good reflected light, it will be found to be clear behind its capsule.

In some cases capsular cataracts form from other causes than attacks of specific opthalmia. In such, it is probable that the deposit on the capsule may be absorbed, and the eye restored to its pristine state.

The third variety of true cataract, known as Capsulo-lenticular or Interstitial cataract, is found in the form of an opaque fluid between the lens and its capsule.

By taking a side view of the eye, these cataracts are easily distinguished from lenticular, because the transparency of the lens can then be seen behind the opaque deposit.

Symptoms.—The state of the pupil is best seen in a diminished light. The existence or otherwise of cataract, the proper motion of the iris, and the state of the structures of the eye generally are then, as a rule, very easily observed. But in some cases it is advisable to take the horse into a darkened stable and to examine his eye by the light of a candle, when the pupil will be found to be fully expanded.

In health, when a candle is moved before the fully expanded pupil,

three images of it will be seen. First an erect image moving upwards and downwards, according as the candle is moved. This image is produced by reflection of the surface of the cornea. Secondly, another erect image produced from the anterior surface of the lens; this also moves upwards and downwards, according as the candle is moved upwards and downwards. Thirdly, a small inverted image reflected from the posterior surface of the lens; this moves downwards when the candle is moved upwards.

In lenticular cataract, in the early stage, the inverted image is indistinct. In its later stage it cannot be seen at all. When the cataract has fully formed, the deep erect image is invisible. In capsular cataract only the front image is visible.

Treatment.—Veterinary science knows no cure for true cataract. We cannot avail ourselves of those operations which in the human subject are so valuable, not indeed for the cure, but for the relief of this disease. The horse possesses a very peculiar power of withdrawing at will his eye into its socket, which would much increase the difficulty of performing any operation; but even if this difficulty be got over, the operations common in human surgery would not be of any use, as it is obviously impossible to supply the horse with glasses.

SPURIOUS CATARACTS.

Spurious cataracts are opaque specks on the cornea, or flocculi of lymph in the anterior chamber of the aqueous humor, generally adherent to the anterior surface of the capsule of the lens or to the posterior surface of the cornea. They are generally the result of common ophthalmia and consist of an effusion of lymph into the aqueous humor. They occasionally occur as a result of the specific disease.

Spurious cataracts are frequently absorbed after a time. Sometimes they appear quite suddenly and without any apparent cause, and disappear as suddenly.

AMAUROSIS.

Synonyms.—Glass eye; Gutta serena.

Amaurosis, partial or complete, results from paralysis of a part or of

the whole of the optic nerve. According to the degree of the affection, the blindness may be total or partial. The eye is generally in all other respects perfect.

Etiology.—Disease of the optic nerve may proceed from various causes—either peculiar to that one nerve, such as excess of glare or heat, or from pressure on it, such as that induced by the formation of a tumor by extravasation of blood, or any morbid effusion, or it may proceed from some abnormal condition of the brain generally. It may also proceed from some abnormal condition of the body, such as an overloaded stomach, which affects the nervous system generally, and with it the nerve of the eye.

Amaurosis is also occasionally, though but rarely, the result of the violent inflammatory action of specific ophthalmia; and it occasionally arises from extreme debility of the whole system from any cause, as from excessive loss of blood. Pressure from a fall backward or a blow on the head may also bring on the disease.

Treatment.—The treatment of amaurosis must depend on the cause from which it is supposed to arise. When originating in atrophy or shrinking of the optic nerve it is incurable.

Tumors and morbid effusions on the brain are sometimes removed by nature, and with their removal the optic nerve may recover its tone. Art can do but little to assist in promoting this change.

In oppression of the brain induced by an overloaded or disordered condition of the stomach, a dose of laxative medicine will be useful:

Linseed oil..... ....℥ x. to xij.
To be given in a mash;

Or,

Powdered aloes.....3 ij. to vi.
Linseed meal.....sufficient
To make one ball with molasses.

On the other hand, if the disease is connected with general debility, generous diet and tonics will be of service.

In all cases, as topical remedies, cold applications to the head and diminished light are to be recommended.

GLAUCOMA.

Glaucoma is an opacity of the vitreous humor, or of the tunica hyaloidea, characterized by a grayish or sea-green appearance of the eyes which comes on gradually in old age. It terminates in total blindness, and is quite incurable.

LACERATION OF THE EYELIDS.

Laceration of the eyelid arises from striking against a rail or other sharp point, a bite from another horse, or other accidental injury.

Treatment.—The treatment usually consists in bringing together the lacerated parts with two or three separate interrupted stitches (see page 31). Great care is needed to prevent the patient from rubbing his eye against the manger. A linen rag wet with water should be hung loosely from above over the eye; or, if there is some inflammation with:

Chloride of ammonium,
Nitrate of potassium..... ....āā ℥ iiss.
Water..... ..... 1 pint.

Dissolve the chloride of ammonium and the nitrate of potassium in the water, and as soon as they are absorbed, dip the cloths in the solution and hang them over the inflamed part.

No part of the injured structure should be cut away, unless it is so hopelessly lacerated as to make re-union very improbable. There is always a strong natural tendency to re-union of these parts, and therefore, with judicious management, a successful result need not be despaired of, even in very severe injuries.

DISEASES OF THE LACHRYMAL PASSAGES

Etiology.—When a weeping or flow of tears over the check is permanent, the cause will usually be found in some obstruction of the lachrymal ducts or canals, which lead from the eyes to the nose, and by

which, in a healthy state, the tears are discharged. The obstruction is generally due to a thickening of the mucous membrane of the duct, arising from inflammation. No remedy is known for this affection. It is unsightly, but not serious. A similar effect may be produced by loss of the lower eyelid.

A trickling unconnected with disease may arise from an excessive secretion of tears caused by some external irritation, by inflammation of the conjunctival membrane, or from swelling of the eyelids, which then obstruct the entrance of the tears into the lachrymal duct. In these cases, the effect will cease with the removal or cessation of the cause.

FOREIGN BODIES IN THE EYE.

Are mostly confined to seeds and particles of hay and straw or small grains of dirt getting within the eyelids.

Symptoms.—The trouble commonly occurs at night. The horse will be found in the morning with the affected eye closed and tears more or less profusely running from it.

Treatment.—The trouble will generally be found under the upper eyelid, which may be gently turned back over a pencil or other small smooth stick; if seen, extract as recommended in simple ophthalmia, page 124. Afterward bathe the eye with lukewarm water and cover it with a wet cloth.

WORM IN THE EYE.

In India a worm is occasionally found floating in the aqueous humor. The treatment consists in puncturring the cornea at its upper inner margin. The humor will then escape, and will carry with it the worm. The humor soon re-forms, and the wound readily heels, and in general no injurious after-result ensues. The inner margin is selected for the operation because the cornea at that part is least dense; and the upper instead of the lower margin, because the aqueous humor, which gradually re-forms, will be less likely to again escape (whilst the wound is healing) than if the incision had been made at the lower part. This parasite very rarely troubles horses in this country.

CHAPTER VI.

DISEASES OF THE LIVER.

Congestion of the liver, Hepatitis, Cirrhosis, Atrophy, Hypertrophy, Jaundice, The Yellows, Icterus.

CONGESTION OF THE LIVER.

Is a very rare disease and is difficult of diagnosis.

Symptoms.—The animal is dull and indisposed to move; the appetite fails and the bowels become disordered; the observable mucous membranes assume a decidedly yellowish tint; the bowels are constipated, and the fæces are hard, scanty, sometimes clay-colored and fœtid. Uneasiness is evinced on the application of pressure to the right foreshoulder. The breathing in general is not much affected, but there are frequent fits of blowing, and there is also a hollow cough. The pulse is full, soft, and compressible. An abnormal appetite is a common symptom, shown by a desire to eat earthy substances and to lick the walls. In rare instances pain is manifested by lameness in the right shoulder.

Treatment.—Bleeding is recommended, no matter how great the apparent debility, provided the artery is full, round, and distinct. Usually the disease yields to less severe methods. The bowels should be opened by some simple laxative, as:

Epsom salts..... ℥ iv.
Warm water.....1 quart

or, if preferred :

Aloes..... .... ℥ iv.
Calomel..... ℥ ss.
Mix with Indian meal and molasses into a ball.

This dose may be doubled in severe cases, but care must be taken not to continue long enough to salivate. This may be administered once or twice a day. Mustard rubbed occasionally over the region of the liver has often a marked effect in relieving the congestion. The diet should be sparing in quantity, easy of digestion, and somewhat laxative.

INFLAMMATION OF THE LIVER.

Synonym.—Hepatitis.

This is also one of the most rare diseases in the horse, and almost impossible of diagnosis.

Etiology.—Similar to those of congestion. It is usually connected with inflammation of some other abdominal organ.

Ascites, or dropsy of the belly, is said to be a common sequel of the attack.

ORGANIC DISEASE OF THE LIVER.

Synonyms.—Cirrhosis; Atrophy; Hypertrophy.

Definition.—Organic disease of the liver seldom occurs as a primary affection. It is usually a sequel of other diseases, especially of any diseases which prevent the free circulation of the blood through it.

Etiology.—A state of undue accumulation of blood in the capillary vessels is the usual commencement of almost all structural disease. This congestion may arise from any affection which interferes with the passage of the blood into the pulmonary artery, for instance, inflammation of the lungs and pleura, influenza, peritonitis, any violent visceral inflammation, valvular disease of the heart, or disease of the pericardium. Enlargement of the liver to a great size and softening of its structures often follows low typhoid affections. It is also common in old cart horses.

On the other hand, atrophy sometimes occurs, and the organ dwindles to half its proper size.

In some cases, the liver takes on a scirrhous or indurated state, and ceases in a great measure to perform its functions.

Ordinary congestion of the liver, especially when it has become chronic, leads to enlargement and softening of the organ, known as hypertrophy of the liver. It is most often seen in very fat horses, such, for instance, as brewers', or gentlemen's carriage horses which have not sufficient exercise. The liver slowly and gradually augments in size, sometimes with no sign of ill health about the animal, until it suddenly bursts its capsule, and death soon follows.

Softening of the liver is probably due to repeated attacks of congestion, and is very difficult of diagnosis. It is said to result in rupture of the liver and death.

Treatment in such supposed cases can only be prophylactic. Not too high feeding and a proportionate amount of exercise. High and overfed horses with plenty of flesh and sleek coats are those most predisposed to all liver troubles.

The liver may also become the seat of tubercular and cancerous deposits. The bile ducts may likewise be obstructed by calculi, when the same symptoms are evinced as in congestion and inflammation.

The existence of any such organic change, though its exact nature may not be discovered during life, is indicated—but often very obscurely—by the same symptoms as those previously described under the head of temporary functional derangements.

Treatment.—In the early stage of organic diseases of the liver, there is often great difficulty in diagnosing it. There is frequently only a passive state of congestion. If detected, the treatment will be the same as that recommended for congestion. In extreme cases of hypertrophy, an external enlargement may possibly be observed. Percussion may aid in forming a correct opinion. In many cases, however, the disease creeps on insensibly and without any well-marked symptoms to a very serious extent.

When any change of structure has taken place, complete restoration is not to be expected; but the further progress of the disease may often be checked for a length of time by keeping the bowels moderately open by means of saline laxatives, careful feeding, and exercise. The iodide of potassium and carbonate of sodium are useful in reducing the excessive action of the organ. Tonics are also beneficial in assisting it to regain its tone.

JAUNDICE.

Synonyms.—The yellows; Icterus.

Definition.—A disease characterized in horses by yellowness of the eyes, white fæces, and dark urine.

Etiology.—Jaundice is caused by suppression, or by reabsorption of bile, and is a symptom rather than a disease itself. Any causes which lead to sluggishness of the hepatic functions, or obstructions of the bile-ducts produce it. Over-feeding and too little work is a common cause.

Symptoms.—Are much the same as in congestion and inflammation of the liver.

Treatment.—If the cause is non-elimination of the bile, the treatment will be the same as recommended for congestion and inflammation. If due to obstruction, the cause of the difficulty should be sought. If the bowels are constipated, avoid purgatives, and give:

Epsom salts.....ʒ iv.
Bran water.....1 quart

or,

Linseed oil.....1 pint

daily until the fæces become soft.

If there are indications that the stomach is acid, shown by the animal licking the walls or eating dirt, give:

Lime water.....ʒ iv.
Water.....½ pint

or,

Carbonate of soda.....ʒ iv.
Water.....½ pint

or, if preferred, the soda may be mixed up with linseed meal and molasses and form a ball. It is not uncommon for the liver to perform its functions irregularly after an acute attack. An excessive secretion is indicated by purging, the dung being coffee-colored; a deficient secretion, by clay-col-

ored passages smelling offensively. When such conditions exist, tonics should be administered:

Sulphate of iron.....	ʒ i.
Powdered gentian.....	ʒ iv.

in the drinking water or sprinkled on the food.

Cinchona bark, chamomile flowers, and quassia may be used if preferred.

CHAPTER VII.

DISEASES OF THE URINARY ORGANS.

Nephritis, Inflammation of the kidneys, Cystitis, Inflammation of the bladder, Diabetes, Profuse staleing, Strangury, Retention of urine, Balanitis, Inflammation of the Penis and Sheath, Azoturia, Black water, Nymphomania, Bloody urine, Phimosis, Paraphimosis.

INFLAMMATION OF THE KIDNEYS.

Synonym.—Nephritis.

Inflammation of the kidneys, or nephritis, is fortunately a rare disease in horses.

Etiology.—Its causes are not well established, but the disease is generally attributed to derangement from too great or frequent doses of diuretic medicines, as turpentiue, the resins, or cantharides; or, more rarely, from the long continued effect of cold, particularly cold water, upon the loins. Sometimes it is induced by the absorption of the active principle of cantharides from large blisters.

Symptoms.—There is fever and colicky pains. The horse is restless and uneasy, breathes short and rapidly, and perspires more or less freely. He lies down cautiously and rises up again, as if suffering from colic; but the abdomen, instead of being hard and distended as in that disease, is tucked up. He sometimes stands with his legs wide apart, arches his back, and straddles in his gait, though these are not to be considered as peculiar symptoms of nephritis. Tenderness and wincing are evinced on the application of pressure to the loins. The most sure evidence is total suppression or but a scanty secretion of urine, a desire to micturate

frequently, but passing no urine, or only a small quantity, highly colored and often tinged with blood. In very acute attacks, the horse will sit on his haunches, groan, and look round and try to bite at his flanks. The bowels are usually constipated, and the pulse is accelerated and soon becomes very quick and weak.

Inflammation of the kidneys is distinguished from a similar affection of the bladder by the secretion being very small and emitted with much groaning and effort, whilst in the latter disease the urine is secreted freely and ejected almost as soon as secreted. In both diseases the bladder is empty.

When the inflammation is caused by the presence of calcareous sub-



FIG. 71.
The Straddling Gait of Nephritis.

stances in the kidneys, a very marked symptom is afforded by the penis hanging pendulous and a constant dripping of urine often tinged with blood. If the patient be a stallion, the testicles are retracted. The thigh on the side of the inflamed kidney, if only one be affected, is generally benumbed. If the disease is not relieved, the strength fails rapidly, and from retention of the constituents of urine in the system the skin often acquires a urinous smell.

Treatment.—The depressing and destructive influence of the arrested urinary secretions must be diminished, as much as possible, by exciting the activity of the skin and bowels. Flannel cloths steeped in very warm water should be at once applied to the loins, and covered with a rubber blanket, to keep up the heat. Give a ball composed of

Powdered aloes..... ..... 3 vi.
Calomel..... .. .. 3 ss.

or,

Linseed oil..... ...1 pint

If the pain and straining are great, add to either of the above an ounce of laudanum, or give:

Extract belladonna..... .....gr. xxx.
Powdered opium..... ..... 3 ij.
Make into a ball with linseed meal and molasses, give three daily while the pain lasts.

If the suppression of urine continue several days, it is recommended that the flannel cloths or a sheepskin be wet with a warm infusion of digitalis leaves and applied as a fomentation to the loins, and continued until the kidneys have commenced to act, when it should be discontinued.

Mucilaginous drinks, such as linseed tea, hay tea, etc., should be given if the animal will take them. The food, which must be sparingly given, should consist of bran or linseed mashes, grass, and carrots. Clover is objectionable.

As soon as the congestion is relieved by these measures, the kidneys will again begin to resume their secreting function. The urine at first secreted, however, is always very acrid, and therefore causes great irritation in the organ. In order to diminish this effect, every endeavor must be made throughout the attack to get the horse to take mucilaginous drinks or even water. Half an ounce of bicarbonate of soda given two or three times a days in the drink will act very beneficially at this period in lessening the acidity of the urine.

CYSTITIS.

Synonym.—Inflammation of the bladder.

Definition.—An inflammation of the lining membrane of the bladder. Exceedingly rare in horses.

Etiology.—Supposed never to occur except as a result of such irri-

tants as croton oil or cantharides applied externally as a blister or taken internally.

Symptoms.—Robinson says this disease is indicated by restlessness referable to abdominal disturbance, a rather peculiar paddling or repeated moving of the hind feet, and occasional whisking of the tail, repeated micturitions with trifling discharge, pain increased on making attempts to examine the state of the bladder from the rectum; and in cases of some severity or long standing, where the contractile power of the sphincter is lessened, there may be continuous dribbling of urine.

Treatment.—Give only linseed tea, milk, or mucilaginous drinks. As a diuretic give:

Extract of hyoscyamus... ..... ʒ i.

If the trouble has been caused by a blister, wash and clean the blistered part thoroughly.

DIABETES.

Synonyms.—Profuse staleing; Diabetes insipidus; Polyuria; Diuresis.

Definition.—A disease characterized by great increase, and generally peculiar alteration of the urine. It is accompanied by excessive thirst, and the body becomes emaciated.

Etiology.—The presence in the system of the active poison of glanders; indigestion, and feeding of damaged or musty hay or oats. Boiled food is also said to induce profuse diuresis.

Symptoms.—The symptoms of polyuria are excessive thirst, and unusual urination. The appetite is depraved, and foul substances are eaten in preference to the usual provender. The mucous membranes are pale and dirty-colored, the breath offensive, and the pulse thin and weak. A disposition to perspire on slight exertion and a rough coat are accompanying symptoms.

The urine is pale and of low specific gravity, often as low as 1003, due to its watery character.

In some cases it may be traced to the too frequent use of "condition balls, or powders."

Diuresis must not be confounded with that simple augmentation in the amount of urine which may arise from a multitude of causes, some of the alimentary, and others of a nervous character. Such augmentation, when only temporary, must not be viewed in the light of disease.

Treatment.—In all cases, a change of food is beneficial. Grass, whenever it can be procured, should be given.

If the organs of digestion, as is frequently the case, are out of order, a dose of:

Linseed oil.....1 pint

will be useful. Give linseed tea instead of water, but if the animal will not take linseed tea freely, he must be allowed water. If the water which he has been drinking is hard, it should be boiled.

Give daily:

Iodide of potassium ..... ʒ i.
Iodine.....gr. xxx.

or the following:

Iodine.....gr. xxx.
Sulphate of iron..... ʒ ij.
Powdered gentian..... ʒ iv.
Make into a ball with meal and molasses.

In bad cases, two such balls may be given daily for two or three days, and is said to be very effectual in promoting a cure.

As great prostration accompanies this disease, a liberal diet should be allowed.

When the bowels are opened, give:

Iodide of potassium..... ʒ ij.

twice a day for three or four days, when its effects should be seen in the diminished thirst and secretion of urine; then alternate with the iodine:

Fowler's solution of arsenic..... ℥ ss.

or,

Sulphate of iron..... ʒ i.

for two or three days, after which discontinue. Either of these last may be given in the drinking water or food.

RETENTION OF URINE.

Synonyms.—Suppression of urine; Ischuria; Dysuria; Strangury.

Etiology.—Anything which impedes the flow of the urine from the bladder, such as spasm of the neck of the bladder, stone in the bladder, cancer of the penis, dirt in the sheath. It may also result from inability or disinclination of the animal to rise upon its feet, as in paralysis, laminitis, etc.

Symptoms.—The symptoms are frequent and ineffectual attempts to urinate; if standing, the animal will stretch itself out, strain violently, and groan with pain, discharging but a few drops of urine, or none at all. Examination *per rectum* will enable the practitioner to feel the distended bladder with the hand, and this distention of the bladder is the diagnostic symptom. Such an examination will also often enable him to discover the cause; if from enlarged prostates, these will be felt as oval bodies immediately within the pelvis pressing upon the urethra.

Treatment.—The making up of the bedding and shaking about fresh straw sometimes creates a desire and attempt to pass urine, and the effort may be successful. The steady pressure of the hand passed through the anus on the fundus of the bladder will often cause the urine to be discharged. Hand-rubbing of the belly is also beneficial.

If the cause be paralysis of any sort, the bladder must be emptied by the catheter, Figs. 58 and 59. Fig. 60 shows the direction taken by the catheter to the bladder. In the absence of a catheter, or preference not to attempt its use, foment the] loins with cloths wrung out in hot water, clothe warmly, and give:

Linseed oil.....1 pint

and afterward a ball of

Ground opium..... 3 iss.
Gum camphor..... 3 ij.
Linseed oil and molasses.....sufficient.

The ball may be repeated if after an hour or two the horse has not urinated.

If from constipation and the consequent accumulation of hardened fæces in the rectum, the cause must be removed by frequent injections of oil and water, or soap and water, or, if necessary, the removal of the impacted dung by the hand, called by some "*back-raking.*" Always empty the bladder by the catheter first.

If retention is caused by the foul condition of the sheath, it may be the difficulty will be overcome without using the catheter when it has been thoroughly cleaned with warm water and castile soap, to which add a few drops of carbolic acid to overcome the fœtid smell. After washing, anoint the sheath and penis with a little vaseline.

BALANITIS.

Synonyms.—External clap; Gonorrhœa of the prepuce; Inflammation of the penis and sheath.

Definition.—Inflammation of the glans penis, generally extending to the sheath.

Etiology.—This is quite common in stables where proper cleanliness is not observed; the natural secretions collect on the penis and folds of the sheath, dust and dirt get between them, and by-and-by an inflammation is set up by the decomposition and irritation.

Symptoms.—At first a slight discharge of yellowish pus is observed, having a very fœtid odor. The parts swell, and ulcers form inside the sheath.

Treatment.—If the penis can be drawn out, wash it thoroughly with warm water and soap; if it cannot be got at, syringe out the cavity of the sheath; then apply:

Chloride of zinc..... ...3 ij.
Water..... .....1 pint.

Repeat daily until cured.

AZOTURIA.

Synonyms.—Enzootic hæmaturia; Nitrogenous urine; Albuminuria.

Definition.—A blood disease characterized by an abnormal amount of nitrogenous material in the system. It powerfully affects the nervous system, causing convulsions and, in fatal cases, death in a few hours.

Symptoms.—Robertson thus describes the symptoms: "They are invariably of an extremely sudden and urgent character; there is no warning or premonitory indications of either disturbed digestion or innervation, rather the opposite, the animal immediately preceding the attack being in the very acme of health and vigor.

Although horses laid aside from work or active exercise and regularly fed may have an attack while stationary in the house, the greater number of seizures are in animals where this rest and steady good feeding has been succeeded by work or exercise; that is, the period of a probable seizure is on being taken from the stable for exercise or work following some days of idleness. On removal from the stable, the animal may proceed a very short distance—I have seen them travel only a few hundred yards, at other times a few miles—when seized with an unaccountable lameness or difficulty in moving the limb or limbs, generally the hind ones, they are with difficulty got into their own or some convenient stable; or they may suddenly reel, lose control over their posterior extremities, and come violently to the ground. Many of these very sudden attacks, unless we bear in recollection the possible occurrence of this disease and know the history of the case, are apt to be at first mistaken for some lesion of the spine or muscles of the back or loins. Other cases, not so suddenly developing the musculo-nervous symptoms, may, in the earliest stages of illness, give indications of colic; they are restless, pawing with the fore-feet, inclined to perspire, and exhibit a disposition to lie down. It is when attempting to do this that we generally observe the feebleness and want of motor-power in the hind limbs. Very shortly the more specially characteristic symptoms show themselves, if they have not been observed from the outset. These are tremors and spasmodic twitchings of the great muscles of the loins and gluteal region, ultimately settling into tonic contraction or more or less perfect loss of power; together with discharge of brown or coffee-colored urine in normal or extra amount.

In the greater number of cases, in the early stages, the pulse will vary in frequency from sixty to seventy per minute, and in character from weak and feeble to rather strong, the temperature ranging from 103° F. to 105° F. In the slightly affected cases the appetite will not be impaired, and the bowels may be natural. In the severely seized the animal is prostrate, perfectly unable to rise, will neither eat nor drink, but continues to make ineffectual attempts to rise, and struggles violently with his legs until completely exhausted. In these latter there are occasionally indications of cerebral disturbance, partial coma, with much engorgement of conjunctival membranes.

During the time they remain recumbent, also in many cases which have been placed in slings, there are periodic fits of straining, ejectment of small quantities of dirty-colored urine, or constant and involuntary dribbling of it from the passages.

The only diseases in the horse with which this affection may be confounded are *anthrax* and *cerebro-spinal* fever. From the former of these it may be differentiated—1. By the constancy of lameness or defect of motor-power in the third limbs, which in anthrax is rarely or only occasionally exhibited; 2. The comparative frequency of this affection and its special liability to follow rest and liberal dieting; 3. The presence in anthrax of the specific organisms, the bacillus anthracis, and the power of propagation by inoculation; 4. The rarity of recovery in anthrax as compared with azoturia. From cerebro-spinal fever it is distinguished —1. By the physical and chemical characters of the urine; 2. By the non-coincidence of the appearance of cerebro-spinal fever with conditions of rest and peculiarities of diet; 3. By the greater constancy in this disease of morbid lesions in connection with the organs of assimilation as contrasted with those observed in the great nerve-centres in the other."

Treatment.—Keep the various excretory organs acting freely, in order to assist nature in expelling the degraded products from the circulation. For this purpose a cathartic or oleaginous aperient ought to be administered without delay. Give preferably:

Aloes	℥ vi.
Ginger	℥ ij.
Linseed meal,	
Molasses	āā sufficient.

The kidneys generally act freely enough, and need no stimulus; but

should they cease to perform their functions, diuretics, and more particularly colchicum,

Tincture of colchicum..... ..... ℥ i.
In drinking water.

are to be used. The animal should always be placed in a large, well-bedded, dry, loose box, with plenty of short straw or chaff around it, which is to be removed as soon as it becomes damp or wet. If unable to rise, it is to be turned from side to side two or three times a day, or more frequently if it becomes uneasy. Enemas are to be administered until purgation commences, and plenty of diluents allowed. Generally the horse is thirsty, and will drink cold water freely and to manifest advantage.

There is no necessity to aggravate the disease by either stimulants or sedatives. They always do harm during the first stages of the malady. If, however, towards the third day the animal seems depressed, moderate doses of spirits of nitrous ether may be given two or three times daily; and about this time attempts should be made to get the horse on its legs. If unable to do so without assistance, the slings should be placed under it, and it is to be gradually placed on its feet. At first it will be much disinclined to stand, and will be apt to fall from muscular weakness; but if the limbs are supported and smartly hand-rubbed for some minutes, they will regain much of their lost power, the horse will begin to "feel himself," as is commonly said, and will often commence to feed and do well. It should be kept in the slings for a few days, but taken out occasionally for a little exercise; and when allowed to lie down for the first time, it should be carefully watched, as it is apt to knock about very much if unable to rise with ease.

During the first few days the diet is to be of the lightest description and restricted in quantity, but when convalescence has commenced, it must be moderately nutritive and easy of digestion, as much muscular debility exists in the digestive apparatus as well as in the voluntary muscles. At this stage Robinson advises a ball of

Nux vomica..... ℥ ss. to ℥ i.
Gentian,
Ginger..... āā ℥ ij.
Linseed meal,
Turpentine..... āā sufficient.

Williams says he has never seen any benefit accrue from external applications to the loins or back; that, on the contrary, fomentations, frictions, stimulants, or blisters increase the irritability of the animal, cause it to struggle when it otherwise would remain quiet, and do much harm; while Robertson advises them.

During convalescence care must be taken not to overload the stomach, and to promote a healthy condition by judicious variety in food.

BLOODY URINE.

Etiology.—Bloody urine generally arises from sprain of the muscles in the neighborhood of the kidneys. It may also be due to an escape of the coloring matter of the blood, without any inflammation being present.

Treatment.—The treatment in such cases is rest and laxative diet, especially grass. Linseed tea should also be given.

PHIMOSIS

Definition.—"A morbid condition of the prepuce or sheath, which, from contraction of the orifice, prevents the drawing in or exit of the penis."—(PERCIVALL.)

Etiology.—Phimosis is the result of inflammation or engorgement of the sheath round about the orifice, or of enlargement of the glans penis, or of co-existence of these states. Blows, kicks, contusions, wounds, abscesses within the sheath, the presence of warts or excrescences of any kind, polypi even, may all be set down as occasional causes. In geldings the penis becomes diminished in volume and length, so much so in some horses as not to appear protruded in the act of urination; in which case the sebaceous secretion furnished by the interior of the prepuce accumulates within the folds of the integument, and acquires, by detention, irritating properties, which cause the glans penis to inflame and swell to that degree that the animal can no longer pass his urine. In addition to these causes phimosis is occasionally seen when the sheath is much swollen from œdema, roduced by want of exercise, disease, the stings of insects, or castration.

Treatment.—The treatment must depend upon the cause. If that be

inflammatory, antiphlogistics, fomentations, and perhaps scarifications; if œdematous, scarifications, frictions with the hand, exercise, diuretics, or purgatives, as the case may be; and when associated with debilitating diseases, tonics and good food. Cold fomentations are generally of great service.

PARAPHIMOSIS.

The penis is protruded in paraphimosis, and cannot be withdrawn within the sheath.

Etiology.—It may arise from a weakened condition of the penis, sometimes associated with debilitating diseases, or a paralysis *sui generis*, or from swelling of the glans penis, with protrusion and enlargement of it, arising from an accident or castration; the sheath forming a tight constriction around it, and preventing its retraction. It may also be caused by excessive venereal action, continued friction against the mare before coition, kicks from vicious females, or blows of a stick. "The penis paraphimosed" (says D'Arboval) "appears protruded out of its sheath to the extent of half a foot, swollen to the size, perhaps, of a man's thigh, evidently in consequence of effusion into the cellular tissue of its envelopes, and is curved in the form of an arc, and knotted from partial circular contractions, which, when excessive, are productive of congestion of the organ (Fig. 72). Its extremity, the part most tumefied, turns of a



FIG. 72.

The penis in paraphimosis.

red-brown; violent inflammation accompanies all this, and the consequent pain is extreme. For all there is so much swelling, however, in general the urine gets a passage, though, should the inflammation run very high, and spread to the body of the penis, gangrene may be the result."

Treatment.—Fomentations with cold water, friction, moderate exercise whenever possible.

Broad's treatment is as follows, viz.:

Put the penis into a tight elastic stocking by squeezing it with the hands, and as it reduces, lessen the size of the stocking, and suspend the penis as much as possible. If there be much effusion into the surrounding tissues, apply a wide canvas band, with long straps and buckles, round the body, so as to support and cause pressure to the swollen tissues. A few hours' compression from the stocking will often reduce it sufficiently to enable the horse to retract it.

Amputation, which is necessary in certain cases, should only be attempted by a professional veterinarian.

CHAPTER VIII.

DISEASES OF THE SKIN.

Cracked Heels, Scratches, Acne, Warbles, Slight Tumors, Sitfasts, Erythema, Mud Fever, Urticaria, Nettle Rash, Surfeit, Scabies, Mange, Itch, Scab, Prurigo, Pruritus, Surfeit, Ringworm, Herpes Circinnatus, Tinea tonsurans, Warts, Eczema, Eczema Simplex, Mallenders, Sallenders, Humid Tetter, Lichen or Rat-tails, Eczema Pustulosum, Grease, Psoriasis.

CRACKED HEELS.

Synonyms.—Scratches.



FIG. 73.
Cracked Heels.

Definition.—Cracked heels are chaps of the skin in and about the hollow of the heel.

Etiology.—This affection is usually produced by exposure to wet and

cold, and therefore occurs most frequently in the fall and winter months. Too close clipping of the long hair which is the natural protection to those parts predisposed to it.

Symptoms.—Lameness, more pronounced when starting off. Dry, inflamed condition of the skin about the parts, and subsequently small crusts from which a thin watery discharge exudes. In bad cases the entire leg, and even the belly is affected.

Treatment.—Keep the parts dry. If necessary to wash, do so with warm water and castile soap, and *dry thoroughly*. If the skin be unbroken, rub with fresh lard or vaseline. Dust with powdered alum twice a day. If cracked, rub with:

Carbonate of zinc	℥ i.
Lard	℥ vi.

Mix.

If the edges of the crusts look indolent, they may be touched with a solution of sulphate of copper, two ounces in a pint of water.

It is a very troublesome affection and often takes a long time to overcome.

ACNE.

Synonyms.—Warbles; Slight tumors; Sitfasts.

Warbles or Slight Tumors.

Definition.—Warbles are recent soft swellings or tumors arising from inflammation of the skin.

Etiology.—They are generally caused by friction or undue pressure of the saddle girth or collar on the part affected, or sometimes by bad saddling or bad riding, even though the saddle fit perfectly. The swelling itself is due to a slight effusion of serum or lymph, or of both, produced by inflammation of the sebaceous follicles of the skin.

Treatment.—The first essential in treatment is to remove the cause of the irritation. In addition, the horse should, if possible, be spared from work for a day or two. The stuffing and fitting of the saddle or other article of equipment should be looked to and, if necessary, altered. Harness lined with woollen cloth of any kind should be avoided. In some cases a chamber must be made over the part affected.

The warble itself will be best treated by the application of solution of

salt and water. If the part continues indolent and is likely to suppurate, the injury is beyond what is usually called a warble, and must be treated according to its nature and degree, as a contused wound, by application of

Biniodide of mercury..... 1 part
Lard.....16 parts

or the continued application of poultices:

Lineeed meal,
Sweet oil,
Boiling water.....āā sufficient.

Mix the meal with the water and then stir in the oil.

Troublesome *fluctuating* warbles sometimes require to be laid open through the centre from end to end. The interior should then be injected with a weak solution of carbolic acid, say:

Carbolic acid..... 1 part
Water.....50 parts

and cold-water dressings with one per cent of carbolic acid may afterward be applied to the part until healed.

Sitfasts.

When a swelling such as just described, either by neglect or by repeated recurrence of the cause, has become hard and insensible, and the skin is permanently injured, it is no longer termed a warble, but is known as a sitfast, because of the difficulty of removing it. The skin becomes thickened and half dead, and is often adherent to the bottom of the sore and kept alive by blood at its root. The sitfast will frequently be found to be partially separated all round from the living skin.

The best treatment is to cut it out. Cut the tissue and remove every particle of the hard horny skin, after which it may be carefully touched with nitrate of silver, to remove any of the disorganized part which has been left by the knife.

True elastic skin of the original quality is never reproduced when once destroyed, either in the case of sitfasts or of any other injuries; but



FIG. 74.
A Sitfast.

a substitute is formed which answers sufficiently well in most cases, and the skin all round will contract in such a way as to leave only a small scar.

ERYTHEMA.

Synonym.—Mud Fever.

Definition.—An inflammation of the outer layer of the skin.

Etiology.—An exposure to cold, wet, undue pressure of the harness, abrasions of the skin. Also hereditary predisposition, clipping, and the practice of cutting the hair closely on the legs, and particularly about the fetlock joint.

Symptoms.—If the skin is colorless, a general redness may be perceived, and there is some heat and slight swelling. In the form termed mud fever, all the legs and the surface of the abdomen are sometimes covered by patches of superficial inflammation. The hair and cuticle subsequently come off in patches. After cracked heels and scratches, the skin sometimes presents a scabby appearance, and the legs swell at night. Slight stiffness may appear in the gait when first moved in the morning, which soon disappears.

Treatment.—For mud fever Williams recommends:

Glycerin ..... ℥ iv.
Diluted solution of subacetate of lead..... .... ℥ ss.

Apply once or twice daily and exercise the animal by walking moderately. Other treatment will be seldom required.

For erythema of the legs.—Avoid the cause; apply zinc ointment:

Carbonate of zinc..... ℥ i.
Lard. ..... ℥ vi.

or a liniment of:

Solution of subacetate of lead..... ℥ ij.
Olive oil..... ℥ viij.

In cases of long standing, it is best to touch the parts with a solution of nitrate of silver:

Nitrate of silver..... ℥ i.
Water ..... ℥ i.

If the skin is very tender and easily galled by the harness, foment the part with:

Acetate of lead..... ..... ℥ i.
Water..... .. ....1 pint

URTICARIA.

Synonmys.—Nettle-rash; Surfeit.

Definition.—This is a frequent form of skin disease in the horse, and consists of an eruption of elastic eminences, roundish or oblong in shape, and attended with itching.

Symptoms.—The lumps rise quickly, and upon the greater part of the body, generally beginning upon the neck, and frequently disappear-

ing as suddenly as they come. They are unequal in size, some like hempseed, others as large as beans, and flattened upon their surface.

The peculiarity of this form of eruption is its suddenness. The lumps appear upon all parts of the body in the course of a few minutes. It is caused by some disorder of the digestive apparatus, and is sometimes preceded by colic and diarrhœa.

A sudden change of diet will frequently produce it, and it is not at all uncommon when horses are first fed on grass. It is supposed that poisonous herbs, a draught of cold water when the animal is heated, sudden exposure to cold and damp, and calculi or worms in the intestines, are causes of it.

Treatment.—As a rule, this is a very simple matter, a mild purgative being all that is necessary. Give a ball of:

Powdered aloes	ʒ vi.
Ginger	ʒ ij.
Linseed meal,	
Molasses	āā sufficient.

Should there be much itchiness—the animal rubbing itself—the skin must be bathed with warm water, dressed with the acetate of lead lotion, recommended for erythema, and low diet prescribed for a few days.

SCABIES.

Synonyms.—Mange; Itch; Scab.

Etiology.—This disease depends upon the presence of a parasitic insect (Fig. 75), which is so small that it can be seen with the naked eye only by the most careful scrutiny. The attacks of this animalcule cause irritation and itching of the skin, and, as a result, the hair falls off in patches.

Mange is a sure sign of neglect and dirt, or of injudicious feeding, or of bad management of some sort.

While mange is said to be non-contagious among healthy and well-groomed horses, it is, nevertheless, proper to isolate any horse affected with mange, and not use the same brush and comb as on other animals.

Symptoms.—Mange usually commences at the roots of the hair of

the mane and tail. Multitudes of minute pustules appear, whose summits gradually expand, burst, and coalesce with one another; and the discharge from these forms patches of crusts upon the skin. Under these crusts the hair loosens at its roots, and either falls out or is rubbed off from time to time, and at length the place is left bare.

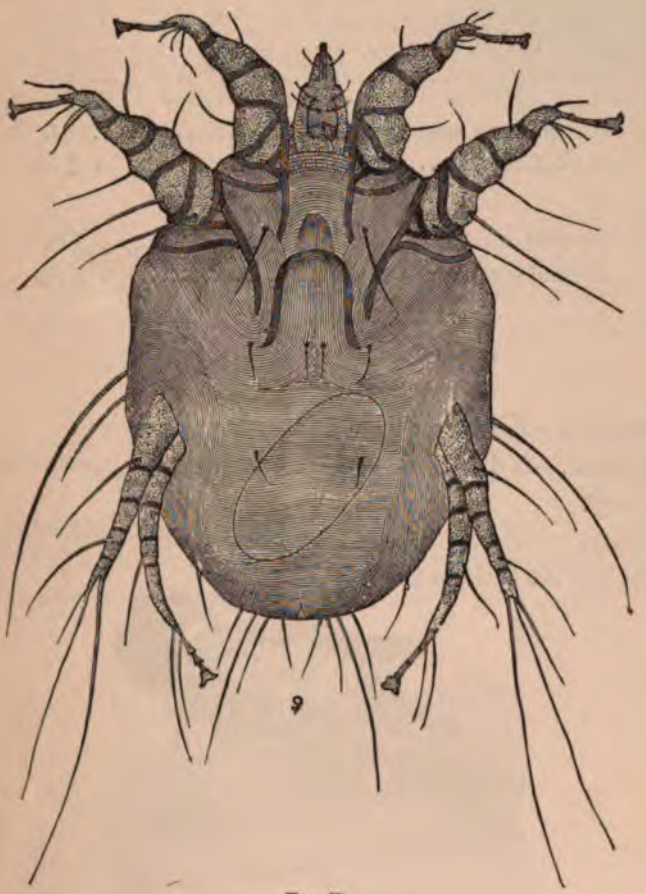


FIG. 75.
Dermatodectes Equi.

The skin loses its elasticity, becomes corrugated in harsh dry folds, especially about the neck and sides; sometimes blood oozes from the bare places. The disease is accompanied with intolerable itching.

Treatment.—The treatment of mange must be thorough to be effective. The parts affected must be dressed with a solution of carbolic acid in the proportion of half an ounce of the acid to a pint of water.

In slight and recent cases, the skin will soon recover its tone when

the itch mites have been killed, and in most cases the hair will grow again.

Brush off dry all the loose incrustations and scurf, and wash thoroughly with soap and warm water in which a little bicarbonate of sodium has been dissolved. Dry, and apply *thoroughly* any one of the following, viz.:

Oil of turpentine	℥ i.
Soft soap	℥ iij.

Or,

Ammoniated mercury	℥ i.
Fresh lard	℥ iij.

Or,

Flowers of sulphur	℥ ij.
Ointment of carbolic acid	℥ vij.

PRURIGO.

Synonyms.—Pruritus; Surfeit.

Definition.—A disordered condition of the skin characterized by intense itching.

Etiology.—It is usually ascribed to over-feeding with highly nutritious food and too little work.



FIG. 76.
Sign of Prurigo.

Symptoms.—Patches of pimples on those parts of the body covered by harness, especially under the collar, which itch intolerably and cause the horse to scratch and bite the affected parts. Fig. 76 is a common symptom of the disorder.

Treatment.—Feed more moderately and give steady work. Mix and apply to the affected parts:

Liquor potassa..... 3 ij.
Hydrocyanic acid..... 3 i.
Water.....1 quart.

Pruritus of the tail is a very common form of the disease, and seems to become a habit with some horses. Sometimes, however, it depends upon the presence of *ascarides* in the rectum. The treatment consists in giving enemas of a decoction of quassia to destroy the parasites, dressing the tail with mercurial ointment, or with equal parts of paraffin and fish oil, and if the disease affects the skin generally, give twice daily:

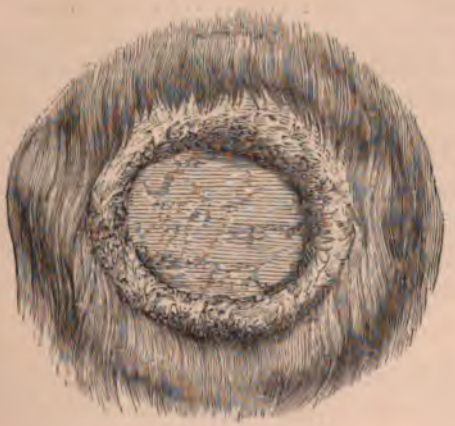
Flowers of sulphur..... 3 ij.
Arsenic .. ..gr. ij.

mixed with the food; and when the prurigo is a habit, the root of the tail must be protected by a strong leather band, securely fastened whilst the animal is in the stable.

RINGWORM.

Synonyms.—Herpes circinatus; Tinea tonsurans.

Definition.—An eruption upon the skin which assumes a circular form. In herpes circinatus, the eruption is vesicular and is non-con-



Appearance of Ringworm.

tagious. When a hair is pulled out, the root or bulb will usually come out with it. The eruption of tinea tonsurans, on the contrary, is character-

ized by absence of vesicles and by the formation of scurf around the hairs, which in this form of ringworm break off short on being pulled. Tinea tonsurans is contagious. Herpes circinatus is due to derangement of the digestive organs, or the respiratory mucous membrane.

Etiology.—Tinea tonsurans is produced by a vegetable parasite which affects especially the hair follicles. The disease may commence in any part.

Symptoms.—In herpes, the vesicles, large or small, in ring form, inclosing healthy skin, are typical (Fig. 77). In tinea, a white scaly scurf, accompanied with staring of the hairs in the part affected, is the first positive indication, followed by a thickened scurf with raised eminences. This spreads rapidly in blotches over the neighboring parts, generally assuming the form of rings, and the hair falls off. The appearance is so peculiar that the disease cannot be mistaken by any one who has ever seen a case.

In ordinary cases, tinea is not very contagious, though generally supposed to be so. It frequently, however, runs through stables, much in the same way as influenza and other diseases, because similar causes produce similar effects.

Treatment.—Herpes commonly requires little treatment. The parts may be washed with lead liniment:

Solution of subacetate of lead	℥ ij.
Olive oil	℥ viij.

In tinea the hair should be clipped off round the blotches, and the parts must be well washed as in mange, and apply:

Iodide of potassium	℥ i.
Flowers of sulphur	℥ ij.
Iodine	℥ ss.
Lard	℥ viij.

Mix thoroughly.

Or,

Nitrate of silver	gr. x.
Lard	℥ i.

In either form of ringworm, a bran mash with a pound of boiled linseed meal daily, in addition to the usual food for a few days, will exert a beneficial influence on the skin; and an alterative consisting of:

Nitrate of potassium .... ʒ ij.
Flowers of sulphur .... gr. xxx.

may also be given in the mash for two or three days.

WARTS.

Etiology.—Unknown.

They appear on the thin and more delicate portions of the skin, as the sheath, the inner surfaces of the hind limbs, the abdomen, the eyelids, and the sides of the nose, and sometimes on the neck, where the skin has been injured by the collar.

They vary in size from that of a pea to that of a large potato. The wart commences as a small round substance, and gradually increases. As it increases, it becomes divided into clefts and fissures, from which the blood occasionally exudes.

Treatment.—Warts, if removed, should be operated upon while yet small. The best practice is to scrape the surface and then dress it with chloride of zinc. Large warts may, however, require to be removed by the knife. Some care is needed in the operation to prevent excessive bleeding. The divided blood-vessels should be stanched by some styptic, as tannin, persulphate of iron, or, if necessary, the application of the hot iron.

In some cases, where there is a small base, the wart may be deprived of its nutriment by means of a silk ligature tied tightly round it, and in due time it will perish and drop off. In other cases, small warts, after an incision has been made in the skin over them, may be squeezed out by the fingers.

It is as well, when the warts appear on such delicate parts as the eyelids or lips, to try the effect of repeated applications of nitric acid, being very careful that the acid does not touch any part except the wart.

ECZEMA.

The majority of skin diseases, says Williams, particularly in the horse, are due to the expression of some form of eczema; indeed, it may be looked upon as the commonest form of skin disease.

The vesicles which characterize eczema are usually developed at the orifices of the cutaneous follicles, are easily ruptured, and discharge a fluid which is glutinous and irritating to the skin. When the vesicles are not ruptured, they terminate by absorption of the fluid; but the disease does not often come to an end with the drying up of one crop of vesicles. More commonly, the eruption is successive, and crop after crop of vesicles is formed; or the surface, on which they first appeared, remains red and raw, and continues to discharge a fluid resembling that contained in the vesicles. After the disease has existed some time, there is a thickening of the derma, which becomes corrugated, more especially in those parts of the body where the skin is naturally loose and movable.

The individual vesicles of eczema do not last long, and in some cases no vesicles are found; but the skin is inflamed, and fissures make their appearance in the epidermis. These fissures are at first superficial, but become deeper if the disease continues. Eczema characterized by fissures is generally a chronic form of the disease. The various forms of eczema which affect horses are: eczema simplex or humid tetter, lichen, and eczema pustulosum or grease.

Eczema Simplex, Humid Tetter,

is a non-contagious disease, and it usually commences about the neck shoulders, back, and thighs. It usually comes on suddenly, and is manifested by itchiness, which causes the animal to rub and bite itself until the hair and cuticle are brought off, leaving the skin red, raw, and inflamed. Successive crops of vesicles develop themselves, dry on the sore skin, or discharge a fluid which seems to cause an extension of the disorder. The parts of the body most usually affected are those which are covered by the saddle or harness; but it may affect any part, such as the head, neck, quarters, thighs, and forearms. It is generally called mange, but it differs from true scabies in two essential particulars, namely, it is not contagious, and does not depend upon the presence of a parasite.

Eczema simplex is sometimes very troublesome and difficult to treat. In some horses it occurs periodically, or when an alteration is made in the diet.

Etiology.—In the summer, horses are subject to it when first put on green food, and almost invariably an animal which has suffered from one attack is liable to a recurrence.

In such instances eczema occurs symptomatically as a consequence of some constitutional disturbance. In other cases, the disease is induced by the direct application of irritants heat, cold, strong ointments of sulphur, tar, and blisters.

It may attack several animals at the same stable, and this may lead one to suppose that it is true scabies; but it is not so, and the reason why several animals are thus attacked is explainable by the fact that they are all partaking of the same kind of food, and subjected to the same treatment in other ways.

Lichen, Rat Tails,

is confined to the legs of horses, and situated along the course of the flexor tendons. Sometimes all four legs are affected, frequently one or two; and from the peculiarity of appearance it gives to the legs the disease is known as "Rat tails." This appearance is due to an exudation around the hair follicles; the hairs remain unchanged, except from friction, and emerge from an elevated papule, giving to the leg an appearance of being covered by the tails of rats.

Eczema Pustulosum.

Synonym.—Grease.

Grease is a disease resulting from inflammation of the sebaceous glands of the skin in or about the heels.

The sores resulting from the attack always present a very unhealthy appearance, and give rise to an offensive smelling discharge. If neglected, they will assume an ulcerative character with deep raw and excessively tender cracks; or the disease may in neglected and aggravated cases go on still further, until granulations called "grapes" are formed, accompanied with much general swelling of the leg. Neglected grease not infrequently produces more or less permanent thickening of the skin, and afterward a predisposition to a recurrence of the attack.

Any very sudden change from heat to cold, or from cold to heat, is very likely to derange the function of the skin. Hence washing the legs, especially with hot water and allowing them to dry by evaporation, or neglecting to dry them after strong exercise, readily induce either cracked heels or grease. When flannel bandages are employed as a

means of drying the legs, care should be taken that they also cover the heels.

The common practice of clipping the hair off the back part of the fetlock and heels is another frequent cause. A moderate amount of hair is needed as a protection to the skin against chill, cold, wet, dirt, and sand, and also against excessive evaporation, especially in those breeds to which such long hair is natural.

The disease is sometimes associated with febrile disturbance. In some instances, swelling of the limb or limbs affected may precede the eruption; whilst in others, the eruption precedes the swelling. The hind limbs are more frequently affected than the fore ones. The discharge is sometimes very profuse, and it is said that it is capable of in-



FIG. 78. FIG. 79. FIG. 80.

Different Stages of Grease.

ducing an eruption in cows and human beings similar to that of variola; on this account it has been termed *equine lymph*.

The discharge from the pustules and vesicles of grease irritates the surface over which it flows; and the skin of the heels—which in health is peculiarly soft and pliable—becomes rigid; the natural sebaceous secretion of its follicles is arrested, and, as a consequence, the movements of the limb cause the skin to crack, and to become a mass of soreness, ulceration, and fungus, accompanied by heat, pain, and lameness. When the disease is of this type, it is very apt to assume a chronic character.

The febrile symptoms, along with the heat, pain, and lameness, diminish; but the swelling still continues, and the skin is constantly moist and greasy from the discharge, which is thick, fœtid, and mats the hairs together. Masses of fungoid granulations now appear, springing from the unhealthy sores, consisting of hypertrophied papillæ, covered over by abnormal horny scales of epithelium, loosely attached to their surfaces,

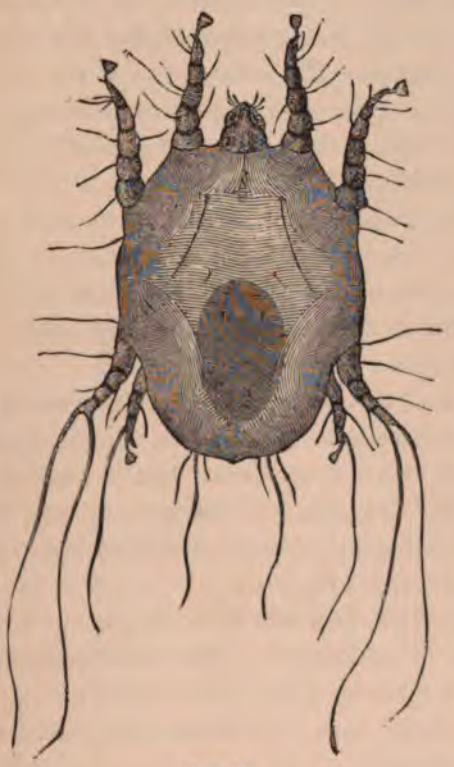


Fig. 81.
Sarcoptes Hippopodus.

easily rubbed off, and exposing a highly-vascular sensitive surface beneath, which bleeds at the slightest touch. These excrescences are commonly called "grapes," and they belong to a class of skin diseases described by dermatologists as "acne," or chronic inflammation of the sebiparous glands, characterized by the eruption of hard, conical, and isolated elevations, which sometimes suppurate on their summits, or pour forth an inordinate quantity of secretion; whilst in other cases

their action is torpid, the sebaceous matter is concreted into a solid form, and distends the excretory duct and hair follicle even to the orifice. Professor Hering has found in chronic grease large numbers of acari, called *Sarcoptes hippopodus*, of which the accompanying woodcut (Fig. 81) is an illustration.

Hering says of it that its body is twice as long as broad, beset all over with hairs like satin; head retractile; proboscis consisting of two valves moving laterally; mouth directed rather downward; close to it two small palpi; eight feet, five-jointed, the last joint as long as the four preceding, with a small sucking disc at the end, and two small hairs on each joint. Two pairs of feet originate near the head, and two posteriorly on the belly. On the abdomen a small prominence, and four long, straight, plumose bristles; their length 0.16, their breadth 0.08–0.085 lines. The three pairs of bristles on the back and those at the abdomen can be raised like the tail of a peacock. The large bristles are plumose; the hairs on the joints of the feet diminish in length toward the extremity of the foot. Only the third joint of the first pair of feet has a longer hair.

The presence of this parasite in chronic grease is accidental; and other diseases, such as canker, mallenders, and sallenders, are apt to become complicated with a mange caused by this parasite. Gerlach designates this epizoon *Symbiotes equi*, and says that the disease induced by it may be called foot-mange; but it has nothing in common with canker, or other known cutaneous eruption.

The swelling of the legs affected with grease, at first consisting of material capable of reabsorption, becomes transformed, in neglected cases, into a low form of fibrous tissue, constituting what is termed elephantiasis; in some cases the affected limbs become enormously enlarged from this cause.

Etiology.—The exciting causes of grease are, improper food, especially moist, inferior, and cooked food, clipping the hair of the heels and legs, filth, and neglect.

Grease may also arise from a cut or bruise of the skin of the heel; but as a general rule it is then due to neglect of the wound rather than to the original injury. Occasionally grease arises from a plethoric condition combined with want of proper exercise.

In some instances the best bred and best cared for horses are liable to grease; but in them it scarcely ever assumes a chronic character, but par-

takes more of an erythematous than of an eczematous nature. In race-horses the process of sweating induces cracked heels ; the sweat, running down the hollow of the heel, dries, and leaves the part impregnated with its salts, which act as irritants to the skin.

Symptoms.—The first sign of grease is an unnecessary stamping of the hind foot and an occasional rubbing of one leg by the other, caused by an intolerable itching, followed generally by swelling of one or both legs. Should the disease go on, a thick discharge will be found clinging in drops to the hairs at the hollow of the heel, and the hairs will stand out so that the skin will become visible. The heels feel hot and greasy. The horse moves stiffly, and it gives him great pain to lift his leg or to have it lifted. The swelling increases and the animal becomes more and more painfully lame, and for fear of flexing his heels, straddles in his walk in a most awkward manner. The heels become excessively sensitive. If not checked by proper means the disease may run on to the ulcerative stage, and finally excrescences like grapes may form. In this latter stage, there is great tumidity of the leg and thickening of the skin. The leg often becomes twice or thrice its natural size, and the hair falls off. Sometimes in neglected cases maggots are found in the sore.

Grease is often an intractable disease, but if promptly taken in hand is not always difficult to cure.

Treatment.—The parts affected, in simple cases of grease, will be best treated by the application of a warm linseed meal poultice for two or three days. To correct the odor, if any is present, add carbolic acid, ʒ i. or ʒ ij., to the pint of poultice. The poultice should be changed twice a day. The discharge should be cleared away with castile soap and tepid water on each occasion, before the poultice is renewed. The hair must be trimmed off as closely as possible.

When the bowels are irregular and the discharges fœtid, doses of two ounces of hyposulphite of sodium may be given in the drinking water.

To bring up the general condition of the animal, a change of diet should be given. A bran mash, daily, carrots and easily digested food, no oats. An ounce of saltpetre given in the drinking water daily is useful. If the animal is full of habit and not weak, a purgative of aloes will generally be of service. As soon as the physic has produced its effects, Williams recommends the administration of arsenic in the following form:

Arsenious acid..... ʒ i.
Carbonate of potassium..... ʒ i.
Water..... ℥ xij.

Boil together slowly until the arsenic is fully dissolved, and strain when cold. The dose for a horse is from half an ounce of this liquor two or three times a day in his food or water.

Ointments should not be applied to the heels, because the dust and dirt which they collect are apt to irritate the sores. In the acute stage, an application of crude carbolic acid will be serviceable; wash the parts afterward with castile soap and tepid water, and then wrap them with bandages drawn snugly, but not too tight, wet with a lotion of:

Acetate of zinc..... gr. xxv.
Water..... 1 pint

and applied as soon after being wet with the solution of the salt as possible; renew twice or three times daily.

The solution of subacute of lead is preferred by some in place of the zinc.

If the disease has been suffered to run on to the ulcerative stage, the sores may be washed with a solution of nitrate of silver, until a healthy action is established. If, however, grapes have formed, the excrescences will need to be cut off. The plan recommended by Williams is generally considered the best, and is as follows:

Two blacksmiths' fire-shovels are the best instruments; one to be made sharp at its edge, and heated to a *red* heat, to remove the excrescences; the other kept cold, and placed between the skin and hot shovel, to prevent undue burning. Many of these excrescences may be thus removed in a few minutes; whereas, if they are destroyed by caustics, such as the sulphate of zinc, corrosive sublimate, or the strong acids, the destruction must be effected by slow degrees, or deep and extensive sloughings of the skin and subcutaneous tissue may occur. When, however, the grapes are few in number, their points may be carefully dressed with the sulphate of zinc or corrosive sublimate, care being taken that the applications be not too extensive.

Chronic eczema, when expressed by an eruption other than that of grease, requires a specialty of treatment applicable to itself.

1st. The crusts and scabs, after being soaked with oil for a few hours,

are to be removed by washing; if the hair is long it must be clipped, and this applies to the greasy as well as to the other forms of eczema. When the hair is removed and the parts thoroughly cleaned, a sufficiency of the following may be applied, not only to the diseased, but to a good deal of healthy skin; remembering that whatever the remedy be, much depends upon its effectual application:

Flowers of sulphur	℥ viij.
Carbonate of potassium	℥ iv.
Carbolic acid	℥ i.
Lard	℥ xxxij.
Olive oil	℥ xxxij.

This is to be left on the skin for two or three days, and then washed off with soft soap and warm water. It acts as a cutaneous stimulant.

The other remedies available in chronic eczema are lime water, bichloride of mercury in weak solution, tar ointment, and mercurial ointment.

The following, which is only a form of the common purgative ball, is highly recommended to be given twice a week during the continuance of the disease, and even for a time after the necessity seems past:

Powdered aloes	ʒ ij.
Powdered resin	ʒ iij.
Powdered nitre	ʒ iij.
Powdered ginger	ʒ ij.
Castile soap	ʒ ij.

Work up into one ball.

PSORIASIS.

Synonyms.—Mallenders; Sallenders.

Definition.—When this disease appears on the back of the hock, it is called mallenders (Fig. 83); when upon the inside of the joint, sallenders (Fig. 82). A chronic, non-contagious inflammation of the skin occurring in patches and covered by epithelial scales. An intractable disease.

Etiology.—Psoriasis, as it first appears, resembles an eczematous

eruption, but after a time becomes chronic and dry. Scales take the place of the discharge. It is considered by some as hereditary.

Treatment.—Is generally of little avail. To prevent the formation of the cracks and chasms, the scales should be dressed occasionally with some oily material; and when they become much thickened by accumulation, they are to be well soaked in an alkaline solution, carefully



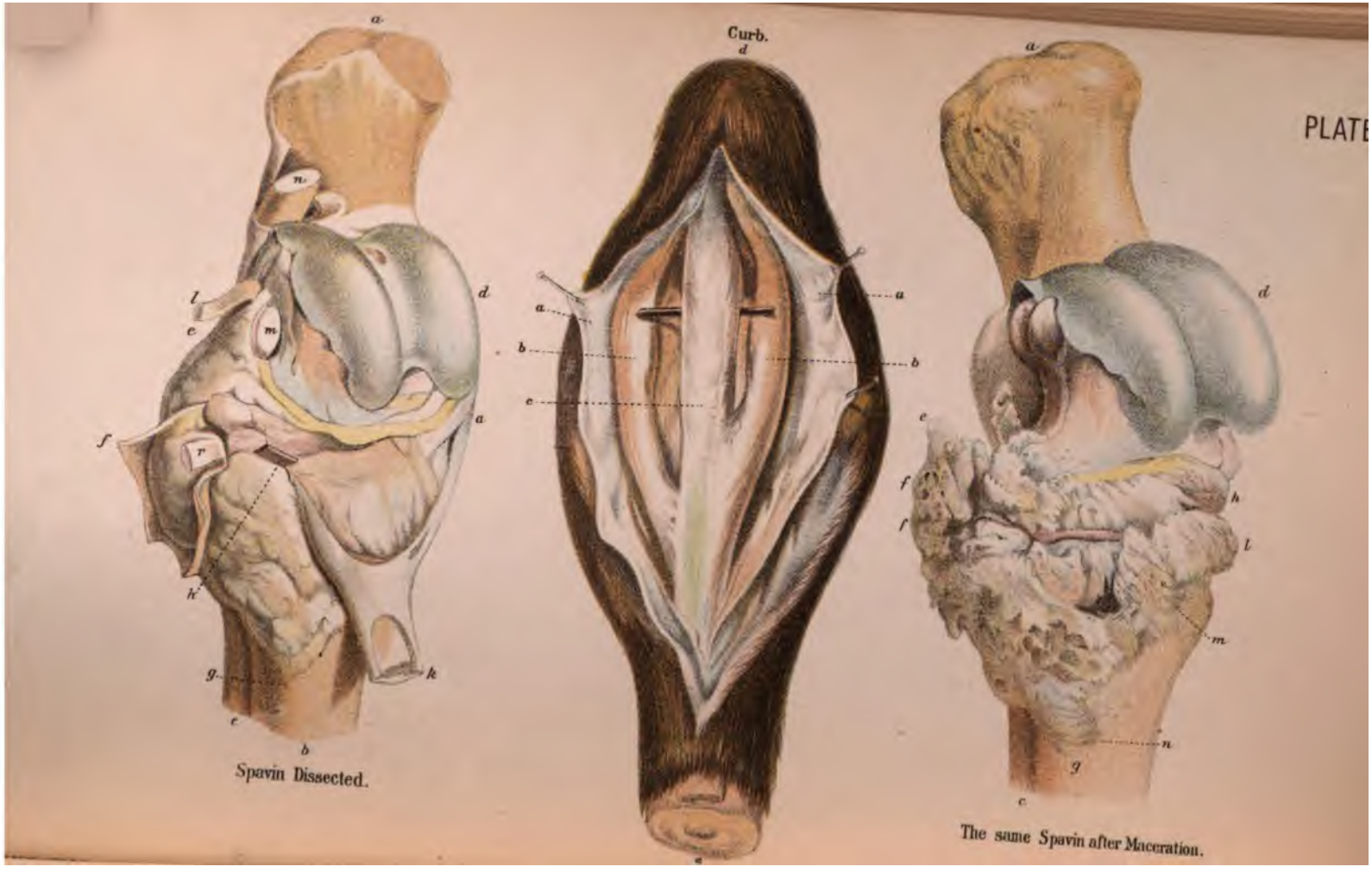
FIG. 82.
Sallenders.



FIG. 83.
Mallenders

washed off, and the raw skin thus exposed, touched with tne nitrate of silver, then covered with tar, or, what is much better, Kennedy's Pinus canadensis. An occasional application of the mercurial ointment is also useful.

To be administered internally, Fowler's solutions of arsenic, in doses of one ounce daily, is recommended.


PLATE
Curb.
Spavin Dissected.
The same Spavin after Maceration.

EXPLANATION OF PLATE II.

CURB AND SPAVIN. (PERCIVALL.)

FIG. 1. Curb. In this posterior view of the hind leg, from the point of the hock to about one-third of the length of the cannon downwards, is displayed a curb, in its ordinary chronic and permanent state, slit open and dissected so as to develop its anatomy.

The subcutaneous cellular fascia, including the annular ligament (*a a*) is dissected off and pinned back, in order to bring into view the sheath of the flexor tendons in the thickened and callous condition (*b b*) in which it is found in—which, indeed, constitutes the essence of—chronic or prominent curb. The sheath has had a longitudinal division made of it, and the divisions (*b*, *b*) separated, with the view of better showing the augmentation of substance it has undergone, the consequence of disease originating in sprain. This division and separation has brought into view also the bursal cavity through which (the same as in the fore leg) the perforans tendon (*c*) plays, in action. This is the cavity which is distended with fluid in recent, and in some instance has been found so in chronic, curb.

(*d*) The posterior side of the point of the hock.

(*e*) The lower (sawn) end of the metatarsal bone.

FIG. 2. Represents a spavin of unusually large size, and more prominent and better defined than such tumors in general are.

a, The os calcis.

b, The large metatarsal or cannon bone.

c, The small metatarsal or splent bone.

d, The astragalus.

e, *g*, The limits, superiorly and inferiorly, of the spavin tumor; whose surface exhibits a knobby irregularity, and whose substance is osseo-cartilaginous.

f, Part of the periosteal membrane, in which the tumor is encased, dissected off.

p, A piece of whalebone inserted into the joint between the two flat cuneiform bones.

f, h, o, A line drawn from *f* to *h*, representing the basis of a triangle whose apex is at *o*, will include the osseo-cartilaginous deposit, spreading from the spavin tumor at the side, upon the fore part of the cannon bone, where it is partly covered by the tendon of the *flexor metatarsi*, which is seen (at *k*) detached and turned down.

r, The inner division of the *biceps* tendon of the *flexor metatarsi*, divided and dissected, in its course to be inserted into the head of the inner small metatarsal bone, which is buried deep in the substance of the tumor.

l, The slender tendon of the *flexor accessorius*, hanging down out of its sheath.

m, The tendon of the *flexor pedis*.

n, The tendon of the *flexor suffraginis*.

FIG. 3. The same spavin, after having been subjected to maceration.

a, Os calcis.

b, Large metatarsal or hind cannon bone.

c, Small metatarsal or hind splent bone.

d, Astragalus.

e, The superior eminence of the ossification constituting the veritable *bone spavin*, now, after maceration, having a rugged aspect, and standing out in rocky prominences, in consequence of having become deprived of its *nidus* or bed of fibro-cartilage.

g, The inferior extent of ossification, spreading down for some distance upon the cannon bone.

f, f, The most prominent or perceptible parts of the spavin tumor during life.

h, The large cuneiform bone coated with osseous matter, of the same porous nature as the tumor itself is composed of, from which, in fact, it is an extension.

l, The middle cuneiform bone, underneath the former, coated after the same manner, and equally involved in the bone spavin disease.

m, n, The osseous deposition, after completely burying the inner cuneiform bone, as well as the head of the inner small metatarsal bone, spreads in an outward and downward direction, and covers the major part of the superior-anterior portion, or head and neck of the large metatarsal bone; so that there is, in point of fact, nearly as much bone spavin *in front* as in the usual place upon the side of the hock and cannon.

CHAPTER IX.

DISEASES AND INJURIES OF THE LEGS.

Spavin, Bone Spavin, Varix, Bog Spavin, Blood Spavin, Broken Knees, Curb, Sprung Hock, Capped Hock, Capped Elbow, Thorough-Pin, Splint, Sore Shins, Ring Bone, Stiff Joint, Anchylosis, Open Joint, Windgalls, Brushing, Interfering, Speedy Cut, Shoulder Slip, Sprain of the Flexor Brachii, Sprain of the Back Sinews, Stifle Joint Lameness, Sprain of the Fetlock Joint, Sprain of of the Suspensory Ligament, Stocking, Swelled Legs, Œdema of the Legs, Lymphangitis, Weed, Inflammatory Œdema, Elephantiasis.

SPAVIN.

(SEE PLATE II.)

Synonym.—Bone spavin.

Definition.—Spavin is an exostosis in the region of the hock. (See Fig. 84.) It is usually found to involve two or more of the weight-bearing bones. It generally appears on the inner side of the hock, rarely on the outer side. Bog spavin, though somewhat similar in name, and also occurring in the hock, has no connection with this disease.

Spavins, which when fully formed do not cause lameness, should never be subjected to active treatment. Treatment in such cases, instead of being advantageous, is very likely to renew the inflammation, which may perhaps produce further growth of bone and eventually lameness.

A spavin, when once fully formed, cannot be removed by any remedial agents, though, in common with all abnormal growths, exostosis generally becomes less as age advances.

Etiology.—The common causes are undue concussion, pressure,

sprain, the wearing of shoes with too high heel calks, which gives rise to inflammation in either the cuneiform bones of the hock, or the tissues in their immediate neighborhood.

As a general rule, exostoses on the exterior of the bones arise from sprains of the ligaments of the hock, whilst the more common ones between the bones are produced by pressure and concussion.

Percivall says: "I am very much disposed to believe in the existence in the system of what I would call an *ossific diathesis*. I have most assuredly seen unbroke colts so prone in their economy to the production of bone, that, without any assignable outward cause—without recognizable injury of any kind—they have at a very early age exhibited ring-

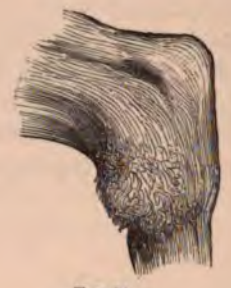


FIG. 84.
Bone Spavin.

bones, and splints, and spavins. There might have been something peculiar in the construction of their limbs to account for this; at the same time there appeared a more than ordinary propensity in their vascular system to osseous effusion. Growing young horses—and particularly such as are what is called 'overgrown'—may be said to be predisposed to spavin, simply from the circumstance of the weakness manifest in their hocks, as well as other joints. When horses whose frames have outgrown their strength, with their long and tender limbs, come to be broke—to have weight placed upon their backs at a time when the weight of their own bodies is as much as they are able to bear —then it is that the joints in an especial degree are likely to suffer, and wind-gall and spavin to be the result. Indeed, under such circumstances, spavin, like splint and other transformations of soft and elastic tissue into bone, may be regarded as nature's means of fortification against more serious failures."

It is generally conceded that hereditary influence has much to do with the production of spavin.

Symptoms.—During the formation of the exostosis, some degree of abnormal heat and tenderness on pressure may be detected, but usually the disease first makes its presence known by the prominence of the bony growth, which destroys the symmetry of the hock. In well-developed cases, the lameness arising from sprain causes the toe to be dragged along the ground instead of being properly raised.

In slighter cases, some stiffness of the hock and an occasional tripping of the toe may be noticed; also a sort of vibration in the hock, when the toe comes to the ground. These peculiarities will be most observable if the horse is trotted on hard, smooth ground. The animal should be especially watched while turning, when a certain degree of flinching will be detected. Exercise even for a few minutes greatly diminishes the symptoms; but when the horse, after exercise, is allowed to stand till cool, the stiffness will recur, probably in an increased degree.

In the stable, a horse, though only very slightly lame from spavin, will often drop very much as the weight comes on the diseased leg, when made to move to one side in the stall. In bad cases, in a state of rest, the animal usually keeps the leg flexed.

If the horse is worked during the formation of a spavin, the inflammation will greatly increase, and an enormous deposit of bone may be the result.

In the examination for spavin, it is necessary, in the first place, to compare the hocks with each other. Any difference in size is very suspicious, especially in the adult horse. A hock, however, which may at first sight appear large on the inside, may on closer examination prove to be exactly similar to the other; and, if so, the formation must be regarded as natural, and generally is sound. It is true that there may be spavins in both hocks; but it is very rarely, if ever, found that the two abnormal growths are exactly similar. In long, coarse-coated horses, the hock should be damped before examination, so as to make the hair lie smooth.

Allowance must be made in certain horses for the shape and prominences of the bones at the inner and posterior half of the hock. In sickle-hocked horses, for instance, there is often an apparent, but natural, enlargement of the bones at the inner and posterior part of the hock, which is often mistaken for spavin. In other horses, there may be

an abnormal prominence of particular bones in both hocks which, if exactly similar, must be regarded as natural.

The examiner should first stand in front and view the hock, as seen by looking between the fore-legs. Any enlargement on the inside, especially on the anterior part, will be well seen from this point. Next he should shift his position a few paces to the side, so as to catch a somewhat side-view of the inner front of the structure. In this position any enlargement in front will be easily detected. He should next view the hock from behind, looking between the legs. Any enlargement on the posterior part of the inner side will then be apparent. Lastly, he



FIG. 85.

Showing seat of bone-spavin, a shallow grove being left in the bony deposit for the passage of the oblique tendon of the flexor metatarsi, under which the spavin is situated.

should move about a couple of paces to the side, and he will notice any undue angularity about the interior edge of the hock.

No enlargement, however, although situated at the precise location of this disease, can safely be said to be spavin, until by manipulation it has been ascertained to be bone. Without such manipulation, other enlargements, such as a distended vein or a thickening of the integuments resulting from a blow, may be mistaken for spavin.

In many cases, however, as has been explained above, there is little or no external enlargement, and we can only infer the existence of a spavin by the peculiarity of the lameness or by abnormal heat about the part. In examining a horse suspected of occult spavin, it is a good plan to lift the hind leg and forcibly flex it up to the thigh several times. After this the horse should be trotted slowly, when, if he has a spavin, he will probably show lameness.

The action, the true and perfect flexion or otherwise of the hock, and the level carriage or otherwise of the hips, should be most carefully observed. The action in many of the worst cases of spavin, namely those between the bones, often affords the only indication of the disease.

Treatment.—If incipient spavin be suspected, rest is the great essential. Either cold applications or fomentations are useful in reducing the inflammatory action, and application of tincture of iodine may be made with advantage.

One should not be over-alarmed or tempted too readily into the adoption of active treatment by a horse going lame during the formation of a spavin. Lameness usually occurs and it probably arises, not from interference, by the exostosis, with the bending motion, but simply from the pressure of the new deposit on the inflamed periosteum covering the bone. The pain, and with it the lameness, usually abates as soon as the periosteum has enlarged and accommodated itself to the exostosis; and generally disappears altogether when, by rest and other appropriate treatment, the inflammation is allayed, and the newly formed deposit has consolidated into bone.

In young horses, especially, a lengthened period of rest without any very active measures is always well worthy of a trial. Their bones and ligaments are weak, and their whole frame is often unequal to the work demanded of them; and in very many cases nothing more than time and the gradual increase of strength resulting from age, good feeding, and carefully regulated exercise are needed to give strength and stability to the weaker structures of the frame. Yet, though rest is essential, some slight exercise, such as that which a horse will give himself in a loose box, is beneficial, lest the parts should become stiffened by disuse, as well as from the deposit of bone.

If the inflammatory action does not subside after a time under the above simple treatment, and the horse still continues lame, it will be necessary to have recourse to other remedial agents, such as a blister of:

Mercurial ointment..... 3 ij.
Oil of cantharides..... 3 iv.

Or, if preferred, a seton may be inserted under the skin, entering a couple of inches above the prominence and coming out an inch or so below it. It should be smeared with some blistering ointment, as:

Powdered cantharides..... 3 i.
Lard..... ℥ i.

Firing is considered by some the most efficacious remedy; and, if properly performed, will not leave bad scars—care being taken not to extend the lines to the front of the joint.

As soon as the process of deposition is completed, whether on the one hand by hastening its full formation, or on the other by checking and limiting the action—the inflammation and pain which accompanied the formation of the exostosis will disappear. The horse will then be lame or sound, according to the position and amount of the new deposit. Commonly the lameness exists only during the formation of the spavin. From two to four months may be required in the treatment.

Unnerving has been recommended for lameness arising from spavin with a view to destroy sensation. The operation, however, is useless, because the nerve which supplies the anterior portion of the hock is so situated that it cannot be reached and divided. It may perhaps be said that the nerve might be cut higher up; but at that point it is too near the muscle which works the tendon.

In the fore-leg, where the operation of unnerving is sometimes applied in navicular disease, the position of the nerve and muscle is different.

BOG SPAVIN.

Synonym.—Varix.

Definition.—Bog spavin is a distention of the capsular ligament of the true hock joint. The only bones which enter into the formation of this joint are the tibia and astragalus. The swelling, which is tense, and fluctuating, shows itself primarily in front, because in that part the capsule is large and loose (Fig. 86). It is accompanied by heat and pain.

It is always a defect and may become a serious blemish. It commonly occurs in weak hocks, because in them any over-exertion is likely to be injurious.

Treatment.—The swelling should never be punctured, and the treatment must be directed chiefly toward reducing its size and allaying pain.

A sweating bandage, that is, a wet bandage covered with oiled silk,



FIG. 86.
Bog spavin.

or rubber cloth, and this again covered with an ordinary flannel bandage, often acts very favorably in reducing the enlargement. An India-rubber bandage with a hole in it, through which the point of the hock may project, is most convenient, and serves an excellent purpose. It is well to rub the swelling carefully, but firmly and thoroughly for some time before applying the bandage.

If these measures fail, resort to the following stimulating ointment, together with rubbing:

Biniodide of mercury	℥ ss.
Lard	℥ viij.

Possibly a blister or a succession of blisters may be temporarily beneficial, but, as a general rule, no *permanent* benefit results from such practice. If the case is of recent origin, the milder measures will probably remove, temporarily at least, the enlargement; whilst if it is chronic, even severe measures will fail to affect it. In fact, in chronic cases, the greater part the enlargement generally consists of thickened integument and of organized deposits in the synovial capsule, which cannot be removed.

As a general rule, it is best not to apply treatment to such

lesions. They seldom produce severe or permanent lameness. When they do, or at least are supposed to do so, the cause of the lameness is generally sprain of the ligaments or tendons or of their sheaths, and the external enlargement is only a result. In some cases, however, the enlargement becomes of so great a size as to be a serious blemish, or even to incapacitate the horse for fast work.

Occasionally in recent cases, arising from severe sprain, we find the bursa or sheath evidently full of synovia, whilst its walls from distention have become very thin. This is especially apt to be the case in the hock. Such cases must be treated as sprains.

BLOOD SPAVIN.

Definition.—Blood spavin is a distention of the veins in the vicinity of the hock.

Etiology.—Pressure of the swelling in bog spavin impeding the flow of the blood.

Treatment.—There is no direct remedy, but any treatment which lessens the bog spavin will decrease the tendency to retardation in the upward flow of the blood. No great harm results from the dilatation of the vein. The greater part of the swelling is always due to the bursal enlargement, not to the vein.

BROKEN KNEES.

Definition.—Broken knees are injuries to the knees which may be a simple scratch or cut or so serious as to include fracture of the bones.

Etiology.—Always due to violence of some kind, usually a fall; bad shoeing will sometimes create a tendency to stumble.

Treatment.—If the *skin is simply bruised*, the hair scraped off, and a little blood oozing from the surface of the skin, a dressing of Kennedy's Pinus canadensis or of white lotion:

Sulphate of zinc,
Acetate of lead .....āā ʒ ij.
Water..... .....1 pint

will probably heal it up and the hair will soon grow upon it again. If a horse has a habit of stumbling, there will come a thickening on his knees which will be noticeable even although the hair may cover them perfectly. If the contusion is great, with but little superficial injury, it may be nec-



FIG. 87.—BACK VIEW OF LEFT KNEE JOINT, SEEN OBLIQUELY FROM RIGHT, AND SHOWING THE DEEP-SEATED LIGAMENTS.

A. Inferior third of radius.
B. Pisiform bone.
C. External small metacarpal bone.
D. Internal small metacarpal bone.
1. External lateral ligament.
2. 3. Scapho-metacarpal ligament.
4. Radio-lunar ligament.
5. Ligament between the pisiform, unciform, and external small metacarpal bone.



FIG. 88.—BACK VIEW OF RIGHT KNEE JOINT, SHOWING THE SUPERFICIAL LIGAMETS.

A. Inferior third of radius.
B. Superior third of large metacarpal bone.
C. Internal small metacarpal bone.
D. External small metacarpal bone.
1. Internal lateral ligament.
2. External lateral ligament.
3. Ligament between the radius, lunar, and pisiform bones.
4. 5. Ligament between the unciform, pisiform, and between the external small metacarpal bones.
6. Strong band of ligamentous fibres, binding down the flexor tendons in their sheath or groove.
7. 7. Groove for the passage of the perforans and perforatus tendons.



FIG. 89.—ANTERIOR VIEW OF THE LEFT KNEE JOINT

A. Inferior third of the radius.
B. Cuneiform bone.
C. Lunar bone.
D. Scaphoid bone.
E. Unciform bone.
G. The great bone.
H. Trapezoid bone.
K. Superior third of metacarpus.
1. Scapho-radial ligament.
2. External lateral ligament.
3. 3. Internal lateral ligament.
4. 4. Ligaments existing between upper row of carpal bones.
5. 5. Carpo-metacarpal ligament.

essary to tie up the animal's head so that he cannot lie down for a day or two. Repeated fomentations with the lotion above recommended will, however, be sufficient active treatment.

When the skin is cut, first thoroughly wash the cut to remove all dirt and foreign substances, clip away the hair about it, and bringing the edges together, fasten them by adhesive plaster, or by tow dipped in styptic collodion, or shellac paste; never try sutures of any kind, they would surely pull out when the limb was flexed. Put a light muslin bandage around the knee and tie up the horse's head, so that he cannot lie down for a few days. If the leg swells, remove the bandage and foment with the white lotion, adding one per cent of carbolic acid if any suppuration shows itself.

If there is much laceration, with perhaps a discharge of synovia from the wound, the resulting inflammation may sometimes be very great, and the swelling considerable, extending as high as the elbow-joint, and as low as the foot; the whole limb being infiltrated with effusion and exudation. The carpal joint becomes greatly enlarged by a fibrinous deposit, which surrounds it, and the synovial discharge very profuse. Generally, with proper treatment, such cases recover, if the tendon be not crushed.

If the tendon has been crushed, although neither lacerated nor divided in any way, it may slough in the course of four or five days, its vitality having been destroyed. This sloughing of the tendon is attended with severe symptoms, and is a source of great danger to the animal's life. The sympathetic fever becomes very high; the respirations and pulse quickened; the bowels constipated; the urinary and other secretions arrested; both the wound and tendon assume a dusky livid or leaden hue; the discharge becomes fœtid, sanious, mixed with blood, and the lameness excessive. When the slough is removed, the carpal articulations are exposed to view; the bones are inflamed, and of a red hue. The power of extension is now lost by the separation of the tendon from its attachment, and the limb is persistently flexed. If an attempt be made to extend it forcibly, great pain is inflicted.

The treatment of such cases, whether the division of the tendon be immediate or not, is a matter of anxiety to the veterinary surgeon, and except when the patient is a valuable stud animal, it is better to destroy it, for even if a cure is effected, the articulation will be anchylosed; and a horse with an anchylosed knee is of little use.

In the treatment of open bursa, or even when the skin only is divided, it is always advisable to apply an immovable splint for the purpose of preventing motion, and to prevent a horse from accidentally striking the wounded knee against the manger, to turn him round in the stable, and

supply him with food by means of a bag suspended from the stall-posts; the slings in the graver lesions playing a most essential part.

In some rare instances the wound in the skin and tendon is situated at the inferior part of the knee, over the articulations of the lower row of carpal bones and the metacarpals. A wound in this part, although penetrating deeply and opening into the joint, is not nearly so dangerous as one over the articulation between the two rows: for there is but little motion, the succeeding inflammation is not nearly so great, nor the supervening anchylosis so important.

When the accident has been sufficiently severe to fracture one or more bones of the knee, the animal should be destroyed.

CURB.

(SEE PLATE II.)

Definition.—Inflammation of the calcaneo-cuboid ligament, accompanied by a hard and painful swelling at the back of the hock. (Fig. 91.)



FIG. 90.
Seat of curb shown at A.



FIG. 91.
External appearance of curb.

Etiology.—A sprain of the calcaneo-cuboid ligament.

Symptoms.—In the earliest stages, curb shows itself as a small hard

lump upon the lower part of the back of the hock, which may easily be mistaken for bone. (Fig. 91.) As the disease progresses, this nodule increases in size, and lameness appears, sometimes, and particularly in young horses, of a severe character.

Treatment.—Rest. Apply a high-heeled shoe, and to stimulate ab-

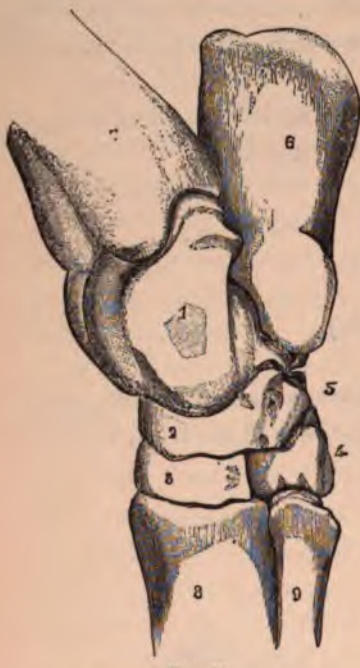


FIG. 92.
Bones of the hock joint.

1. Astragalus.
2. Cuneiform magnum.
3. Cuneiform medium.
4. Cuneiform parvum.
5. Cuboid.
6. Os calcis.
7. Tibia.
8. Great metatarsal, or cannon or shank bone.
9. Inner small metatarsal.

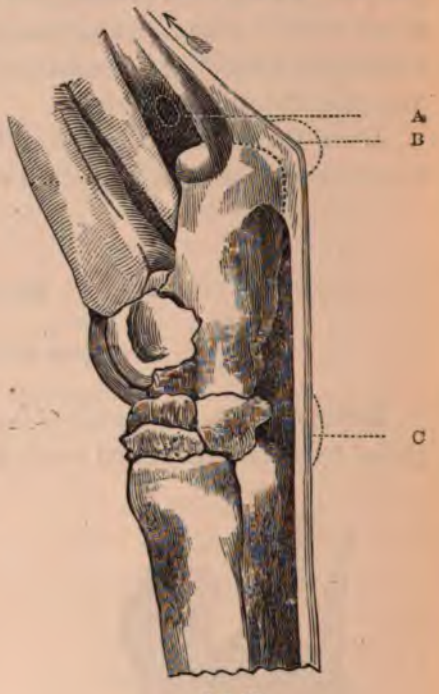


FIG. 93.
The hock and its lesions.

A. Seat of thorough-pin.
B. Capped hock.
C. Curb.

sorption of the excrescence, apply repeatedly a blister of biniodide of mercury:

Biniodide of mercury	ʒ i.
Lard	ʒ viij.

Firing may be tried if the lameness is persistent and the inflammation has subsided.

SPRING HOCK.

Definition.—An inflamed condition of the ligaments of the hock bones.

Etiology.—A violent strain generally affecting all the ligaments.

Symptoms.—Sudden and great swelling both above and below the hock, though not so much on the hock itself. This is accompanied by heat and extreme lameness.

Treatment.—Put the animal in slings at once, as it will not voluntarily lie down. A dose of physic:

Aloes	℥ vi.
Gentian	℥ ij.

Foment the swelling several times daily with hot water in which a little laudanum has been mixed, to relieve pain and to reduce the swelling:

Laudanum	℥ ij.
Water	1 quart.

After the inflammation has subsided, the biniodide of mercury ointment may be smeared on the hock:

Biniodide of mercury	ʒ i.
Lard	℥ viij.

CAPPED HOCK.

Definition.—*Synovial capped hook* is a firm, fluctuating swelling on both sides of the point of the hock, causing lameness and sometimes decay of the top of the os calcis.

Serous capped hook is a serous abscess in the areolar tissue between the gastrocnemius internus tendon and the skin (Figs. 93 and 94), and is generally caused by striking the point of the hock against some hard object, as in kicking.

Treatment.—Apply cooling lotions, as:

Chloride of ammonium in powder,
Nitrate of potassium in powder.....āā ʒ iiss.
Water.....1 pint.

As soon as dissolved, dip cloths in the solution and apply to the inflamed part.

Applications of hot water are sometimes sufficient to reduce the swelling.



Fig. 94.
Capped hock.

Serous capped hock may be treated after reduction of the inflammation by blistering with biniodide of mercury, or by pyropuncture, which is best performed with Professor Williams' instrument, Fig. 22; heat it to redness only, and force the points through the skin and into the bursa, but not to the bone.

Synovial capped hock may have a seton run through it, and kept in not longer than two weeks.

The cyst sometimes becomes consolidated, either from the treatment employed for its removal, or from some other cause. The repeated application of iodine, or its combination with mercury, will often reduce it very considerably.

Iodine..... gr. v.
Iodide of potassium..... ʒ i.
Water..... ʒ vi.

In some cases a strong application, such as one drachm of the biniodide of mercury to the ounce of lard, will answer; in others a frequent application of a milder preparation will do best. The following is recommended:

Biniodide of mercury..... ℥ i.
Water..... ℥ xij.
Iodide of potassium, sufficient to dissolve the biniodide.

This is to be applied once or twice a day until slight soreness is produced, and reapplied when the soreness disappears. If possible, the horse should be turned out to grass, or kept in a thickly bedded box during treatment.

CAPPED ELBOW.

Definition.—Is a serous abscess or soft tumor, formed by an effusion of serum into the areola of the connective tissue of the elbow.

Etiology.—These unsightly tumors are caused by the horse lying upon the heels of his shoes which will usually be found to be longer than they should be.



FIG. 95.
Capped elbow.

Symptoms.—The only sign of this deformity is that afforded by the swelling of the tumor itself. (Fig. 95.)

Treatment.—First see to it that the shoes are properly made, and then tie up the foot which causes the trouble, every night in old cloths.

The best mode of removing the tumor is by puncture; the cavity afterwards should be injected with a solution of:

Sulphate of zinc.....gr. x.
Water.....℥ i.

or of:

Tincture of iodine.....gr. v.
Iodide of potassium.....ʒ i.
Water.....℥ vi.

and the orifice of puncture kept open until the cavity of the cyst has become obliterated. Another plan is to excite the suppurative action in it after it has been punctured, by injecting a stimulating mixture:

Solution of acetate of ammonium.....℥ i.
Olive oil.....℥ ij.

or by inserting a seton through its centre. It is useless to puncture and allow the wound to close immediately, for the walls of the sac have acquired secreting properties, and continue to pour out the serosity, which will speedily fill the cavity of the cyst. It is therefore necessary to keep the puncture open until the walls of the sac have become adherent to each other, and its cavity destroyed.

When the cyst has become consolidated by the causes already given, it will often be found that a little suppuration occurs in the centre of the tumor; but it is never very extensive, and the suppurated spot is surrounded by a thick wall of condensed fibrous tissue of a grayish appearance.

There are two ways of removing the tumor when in this condition—by excision, and by sloughing it with caustics; the latter being considered the best, provided it is carefully done. Puncture the tumor in two or three places, and insert into each puncture a very small quantity of finely powdered corrosive sublimate and arsenic, in equal parts, rolled up in a small piece of tissue paper. The effect of this is twofold:—(1*st*.) It destroys the vitality of the tissue which it touches; and (2*d*.) Excites absorption throughout the whole extent of the tumor. The absorption first excited in the living structures in immediate contact with those destroyed by the agent, whereby a line of demarcation is formed between the living and dead tissue, becomes general throughout the tumor, and in a few days it will be seen that it has diminished in volume in every direction. After the sloughs caused by the caustics have been removed,

the parts should be kept clean for a few days, at the end of which it may be necessary to reapply the caustic.

If excision with the knife be preferred, the operator must make his incision in the perpendicular direction only, as a crucial incision leaves an ugly blemish. Two incisions parallel to each other may be required in very large tumors, and about an inch apart, in order to remove a portion of the skin which, if left, would be an ugly blemish.

THOROUGH-PINS.

Definition.—Thorough-pin is the name given to a bursal enlargement which occurs at the upper and back part of the hock beneath the great extensor pedis tendon. The swelling appears sometimes on one side only, but more frequently on both sides. (Fig. 96.) (See also Fig. 93.)



FIG. 96.
Thorough-pin.

Etiology.—Overwork, sprain, faulty conformation, or chronic inflammation of the joints may be set down as a usual cause; yet they sometimes occur without any such violent exciting causes, and can then only be attributed to either a special irritability of the synovial membrane, on account of which it is excited to increased action on very slight provocation, or to weakness of the coats of the blood-vessels of the membrane, through which an undue effusion takes place.

Chronic inflammation of the joints, which is often found as a result of pneumonia, influenza, and sometimes of general debility, is another common cause.

There are two kinds of thorough-pin, namely, those arising from irritation in the true hock joint, and those which are caused by irritation or sprains of the flexor pedis tendon.

Thorough-pin arising from iritation of the true hock joint is in fact only a further development of bog spavin. The increased secretion of synovia, for reasons already given, shows itself primarily in distention of the lower part of the bursa. When this portion is full, any further increase shows itself in the upper part. The swelling appears equally on both sides, and the fluid may by moderate pressure be forced from one side to the other. Hence is derived the name thorough-pin or running "through" from side to side.

The other and more common description of thorough-pin is not connected with the true hock joint; but arises from irritation of the perforans muscle of the tendon flexor pedis.

This tendon is tightly bound down at its upper part by the ligaments at the back of the tibia and again below as soon as it reaches the inside of the hock. Hence any increased secretion of synovia can only lodge in the intervening space, *i. e.*, in the hollow of the hock, either on one or both sides.

If the seat of the injury be high up (and it generally does occur, as we might expect, near the bend) we find the enlargement on both sides; but that on the outside is generally larger than that on the inside. If on the other hand the seat of the injury is lower down, the swelling may, on account of the position of the part of the tendon injured, appear only on the inside; but it more often appears on both sides or on the outer side only.

Thorough-pins arising from irritation of the flexor pedis tendon are at once distinguished from those described in the preceding paragraph, because there is no lower enlargement or bog spavin. It is, however, very possible that both kinds of thorough-pin and bog spavin may be present in the same hock.

Bog spavins and thorough-pins vary very much in size according to the nature and degree of the particular case. They may be so small as to be scarcely perceptible, or they may be of enormous size.

Treatment.—The most active method is to puncture the sac at the lowest part and allow the fluid to run off; keep the puncture open several days and inject it with a mild solution of sulphate of zinc:

Sulphate of zinc..... ℥ ss.
Water.....1 pint

Apply a truss, Fig. 97, so constructed as to press firmly on both sides of the hock, so that the sides of the sac may be brought together and united.



Fig. 97.
Truss for treatment of thorough-pin.

If during the treatment the parts become hot and tender, discontinue the treatment and apply cold until the inflammation subsides.

SPLINT.

Definition.—Splint is an exostosis or deposit of bone either between one or other of the small bones and the shank, or upon any of the three bones of the fore-legs.

As the greatest strain and concussion always fall on the inside on account of its being more under the centre of gravity of the superincumbent

weight, the exostosis generally develops on or towards the inner side, and usually a little above the centre of the bone between the knee and the fetlock.

Percivall describes five classes of splints:

1st. Simple.



FIG. 98.

Ordinary form of splint on the inner side of the fore-leg. *a*, Intermetacarpal groove, smooth and healthy. *b*, *b*, Osseous deposit. *c*, Irregular bony growths.



FIG. 99.

Compound splint. *a*, Intermetacarpal groove, healthy. *b*, *b*, Osseous deposits, *c*, *c*, *c*, Irregular bony growths.

A comparison of Figs. 98 and 99 with Figs. 100 and 101 will show the changes in the bone in splint.

2d. Double or pegged splints; that is, those which are found upon both aspects of the limb, with an osseous communicating bar running from one to the other.

3d. Those close to the knee.

4th. Consisting of two or more exostoses upon one side of the leg, one above the other, with perhaps an osseous communication.

5th. Little bony excrescences, involving the knee-joint, namely, the head of the metacarpus minor internus, and trapezoid, or metacarpus minor externus, and unciform.

A simple splint, when not causing lameness, and in a position removed from either articulation or tendon, is said by Williams not to be looked upon as an unsoundness, but all the other forms must be classified as causes of unsoundness, as they are at any time liable to cause lameness and are indicative of more disease than is apparent either to the eye or



FIG. 100.

Inner side view of the bones of the fore-leg in healthy condition.
1. Great metacarpal, or cannon bone.
2. Inner small metacarpal or splint bone.
3. Outer small metacarpal.
4. Sesamoid bones.
5. Os suffraginis, or pastern bone.



FIG. 101.

1. Great metacarpal bone.
2. Outer small metacarpal bone.
3. Inner small metacarpal.
4. Sesamoid bones.

touch of the examiner; disease involving articulating surfaces, ligamentous structures, or interfering with the movement of a tendon.

Splints fully consolidated to do not, as a rule, cause lameness, nor do they affect the gait in an appreciable degree.

Etiology.—Although the immediate causes of splint are irritation

and inflammation in the parts affected, yet the occurrence of these causes in any particular horse and at any particular time is mainly dependent on the conformation of the leg, on the work to which the animal is subjected, on the weight he has to carry, and on his age.

Highbred horses and those which are considered roadsters are most liable to splint. Heavy animals and those which are not called upon for fast work are not commonly troubled with them.

But no cause of splint is perhaps more common than the ordinary practice of subjecting young horses to work for which their young bones, ligaments, and tendons are unequal.

Horses at an early age may no doubt do a certain amount of work, and perhaps may be none the worse for it; but the work demanded of them is often in excess of the age and capability of the animal. It is mainly from this cause that so many horses whose make and shape are unexceptionable are affected with splints.

The exostosis arising from these and such like causes usually appears about midway between the knee and the fetlock, because the middle is the weakest part in long bones.

Although some defect in conformation, or some excess of work relatively to age and structure are the ordinary causes of splint, yet in some cases the growth can be traced to no other causes than an hereditary predisposition. In such animals we generally find spavins and other exostoses concurrently with splint.

Symptoms.—Large splints are easily enough both seen and felt, but the detection of an incipient or very small splint is often a difficult matter.

The signs of splint are lameness accompanied with pain on the application of pressure to the seat of the disease, also heat and throbbing of the arteries of the part, and a marked increase in the lameness at the trot over that exhibited at a walk. The lameness produced by an incipient splint is often excessive. In many cases, however, the animal goes sound at a walk, though *very lame* at a trot. In cases of doubt, the horse should be trotted down hill on hard ground, when the increased concussion will cause him to favor the lame leg.

The lameness arising from splint is further distinguished by a very marked dropping of the head when the sound leg comes to the ground, and a corresponding jerking up of the head when the lame leg is brought down.

In feeling for splint, the opposite leg should be held up in order to compel the animal to brace up the tendons of the affected leg, when any inequality about the bones will be more easily felt; and secondly, the lame leg should be raised in such a manner as to bring the knee of the horse under the arm of the examiner: in this position the tendons are fully relaxed, and the bones can be felt to advantage.

In either of these positions the leg is favorably placed for examination, and if the fingers are then applied along the leg and into the channel between the inner small and great bone, the incipient splint will probably be detected by the inequality, if any such yet exist; or by the pain evinced on the application of pressure to the inflamed part.

In some cases, however, the incipient splint is so small, and possibly the seat of the inflammatory action may at first be so completely in the inter-osseous ligaments between the bones that nothing can be felt; and the only indication leading to a suspicion that a splint is forming consists in the horse going *very lame* at a trot, whilst sound at a walk. A little extra heat may perhaps be felt on careful examination. The development of a splint may in such cases be expected and must be carefully watched for. The lameness and heat, if the horse is rested for a few days, will sometimes disappear; but will reappear if the animal is again worked.

Williams' statement of the peculiarities of splint lameness is as follows.

"The lameness may precede the appearance of any swelling or deposit, and in such a case it is apt to be confounded with that arising from other diseases. But if the following observations are kept in remembrance, no mistake need be made:

"1st. The age of the animal. The young horse is most liable to splint lameness, the older horse to navicular disease.

"2d. The peculiarity of action. A horse lame from splint will walk apparently or nearly sound, but will trot very lame, the *drop* of the head and body upon the sound side being very great, and out of all proportion to the apparent soundness of the walk.

"3d. A want of flexion may be observed at the knee.

"4th. When the patient first comes out, and is made to trot, he may go moderately sound, but after a time the lameness increases, the concussion being a cause of pain. In navicular disease the lameness generally decreases with exercise.

"5th. Pressure upon the part of the leg where splint is likely to be

will cause pain; some heat is present, and, by a careful manipulation, a hard swelling, perhaps smaller than a pea, may be felt. In some cases the exostoses soon develop themselves, and then there can be no further difficulty; but in others, this does not occur for several weeks, and these are most unsatisfactory to the surgeon. In some rare cases the lameness is very excessive, the horse being scarcely able to put any weight upon the affected limb; standing with the toe only touching the ground, with great heat and swelling of the part affected, at the same time suffering from constitutional disturbance to a considerable degree."

Treatment.—If the splint does not cause lameness, it should be left alone.

The nature and cause of splint very clearly indicate the treatment required—namely, rest. This powerful sedative may be assisted by the application of a bandage wet in cold water, around the part affected.

In most cases these remedies will be sufficient. If, however, after an interval of a month's or six weeks' rest, the horse continues lame, and the seat of the splint under manipulation is very sensitive, it may be advisable to apply a blister:

Cantharides in powder..... ℥ ss.
Lard ..... ℥ iij.

or the biniodide of mercury ointment:

Biniodide of mercury..... ℥ i.
Lard..... ℥ vi.

or a seton.

If the cantharides are mixed with the lard hot, one-half this amount will suffice in the same quantity of lard.

In some cases, if a splint is treated by rest in the very early stage, the lameness rapidly disappears; but the lameness recurs as soon as the horse is put to work. If this occurs several times, the better plan is to give the animal exercise enough to moderately develop the splint.

Williams strongly recommends "subcutaneous periostiomy" or cutting with a knife into the new bony formation, or in obstinate cases the use of the actual cautery; such measures, however, are not often necessary.

A splint, when once fully formed into bone, cannot be removed; but Nature in the course of time often absorbs a portion of the abnormal growth, and hence it is not uncommon to find the legs of old horses free or nearly free from external exostosis.

SORE-SHINS

Is primarily inflammation of the periosteum of the anterior portion of the metacarpal bones from the knee to the fetlock, particularly of young horses, too early put to work.

In consequence of the inflammation of the periosteum, ossific matter is secreted, which forms in small nodules or in some instances in thin layers on the surface of the bones. (Fig. 102.)



Fig. 102.
Sore-Shins.

Etiology.—It arises from the concussion upon the soft and undeveloped bones of the fore-legs, produced by hard galloping. Usually the leg which leads is the first affected.

Symptoms.—Lameness; the horse goes more or less short in his gallop; swelling above or in front of the fetlock, elastic and protruding at first, but finally becoming hard, shifting from one part to the other if both are affected. In the early stages of the attack the horse may have fever, the inflammation be acute, and the animal very lame.

Treatment.—The treatment in the early stage consists in rest, aided by warm applications containing opium, as:

Laudanum..... ℥ ss.
Water.....1 pint.

A dose of physic:

Aloes..... ʒ v.
Ginger..... ʒ ij.
Molasses .....enough to form a ball

and a long rest with low diet and quiet will often complete a cure.

RING BONES.

Definition.—Are bony deposits upon the pastern bones, forming a more or less complete ring around the bone. (Fig. 104.) False ring bone is simply an exostosis on the middle or upper part of the long pastern bone (Fig. 103), which may, if very large, cause temporary lameness while forming, but cannot be considered an unsoundness.

True ring bone is quite a serious matter, and the degree of lameness does not always depend upon the size of the deposit. Sometimes but little evidence of its formation may appear upon the front of the bone, and the continuity of the ring may be defective. When chiefly upon the sides of the bone, the lameness is usually less than when upon the front, and precedes or accompanies the formation of the bony deposit, disappearing when anchylosis is complete. When the deposit is just above the coronet, it is called low ring bone, Fig. 105; when nearer the middle of the pastern, high ring bone, Fig. 104.

Etiology.—Ring bones are the result of inflammation originating in the extremities of the bones or synovial membranes of the articulations

which they involve; due to hereditary predisposition, rheumatism, cidental injury. Long pasterns are most subject to ring bones.

Symptoms.—The gait of a horse lame from this cause is cha istic. If in the fore extremity, except the deposit be on the po aspect, the patient puts his heel to the ground first; but when i hind pastern, the toe touches the ground first always when it is si in the upper position, except it be in front; when in the lower po the heel comes down first. From this peculiarity in putting the f the ground, it is apt to be confounded with laminitis, seedy-toe, a



FIG. 103.
False ring bone shown at *a*, *a*.



FIG. 104.
High ring bone.



FIG. 105.
Incipient ring bon ning at the lower ity of the os suffr

flammation of the coronary band. It differs from laminitis by th sence of pain at the toe, freedom from fever, etc., and by the heat confined to the upper part of the foot only.

An examination of the foot will determine whether there be a s toe or a sand-crank in its front; and the absence of the striated ap ance of the wall of the foot will distinguish it from inflammation o coronary substance.

Treatment.—If the horse put his fore-legs down heel first, put on a shoe worked very thin behind, such as described by Broad as follows: "Extremely stout, wide-webbed, and long bar-shoes, make from iron about twice the ordinary thickness of those of the particular animal under treatment; make them gradually thin from behind the quarters, so that the heel part of the shoes may be as wide and thin as possible, and fitted rocker fashion to allow the weight of the horse to be on that part; put them on with leather soles, using only sufficient nails to insure their staying on for two or three days." If, on the contrary, the horse walks on his toe, shoe with a high-heeled shoe.

Fomentations of hot water with laudanum, an ounce to a quart, will allay the pain. Afterward apply blisters to hasten the ossific process. The fly blister may be used, or biniodide of mercury, as preferred:

Powdered cantharides ..... ℥ ss.
Lard..... ℥ iij.

Or,

Biniodide of mercury .... ℥ i.
Lard..... .... ℥ vi.

ANCHYLOSIS.

Synonym.—Stiff joint.

Definition.—Anchylosis or stiff joint is a result of previous disease, rather than a disease itself. It is occasional by the presence of deposits which have resulted from previous inflammation in the structure of, or in the neighborhood of the joint. It consists in more or less complete consolidation of the parts within or around the articulation.

Anchylosis may arise from thickening and induration of the fibrous capsule, or from the formation of fibroid bands within the joint; or it may be caused by partial or complete erosion of the cartilages and synovial membranes; their place being supplied by a fibroid or a fibro-cellular tissue, by means of which the articular ends of the bones are united. Or it may arise from shortening, contraction, or wasting away of the muscles which in health move the joint. In other cases the anchylosis may

be osseous, *i. e.*, bony union may have taken place between the bones of the joint.

Inflammation in a joint, or even in the neighborhood of a joint, is always a source of some danger. There is always some reason to fear lest the deposit resulting from the inflammation should interfere with the free motion of the part, even if it does not produce partial or complete anchylosis.

Treatment.—For bony anchylosis there is no remedy. The previous disease, whatever it may have been, has caused the mischief and anchylosis is the result.

For mere stiffness (as distinguished from anchylosis) arising from recent thickenings or deposits in or about the neighborhood of the joint, the treatment consists in rest; and in the application, as soon as the active inflammation has left the part, of absorbents, such as mercury, iodine, or biniodide of mercury. Although we cannot be certain of a favorable result, yet there is a reason to hope that by the use of such means so much of the thickening or exostosis may be removed as will at least prevent its interfering with the motion of the joint. With the removal of such interference, the pain and irritation will cease.

In human surgery, operations are sometimes undertaken for the removal of such deposits; but in the horse they do not answer, because there are no means of placing him in such position as will take the weight off the limb for a sufficient length of time after the operation.

OPEN JOINT

Definition.—Is an exposed condition of a joint, accompanied by a discharge of synovial fluid and extensive inflammation.

Etiology.—Some penetrating injury in the neighborhood of the joint, or sloughing of injured parts so as to expose the bones of the joint.

Symptoms.—An open joint, when occasioned by puncture or incision, is not at first (if unassociated with fracture) attended by severe local or constitutional disturbance; but at the end of a period varying from two to ten days pain comes on, and spreads over the joint, which soon presents a considerable amount of swelling and tension. The swelling is at first tense, but elastic; however, it soon becomes hard and unyielding, and accompanied by great constitutional disturbance, the pulse

rising in frequency, becoming hard and wiry in its character, and the animal evincing acute and agonizing pain by partial tremors and sweats upon his body. In fact, all the constitutional symptoms indicate a state of great irritability. The lameness is excessive. The animal is scarcely able to put its foot to the ground, whilst at the same time the pain causes it to keep it in an almost continual state of motion. An injury not at first penetrating the joint may do so in the course of three or four days, by sloughing of the tissues around it, these having been destroyed but not removed by the violence of the injury.

The discharge of synovia may be very trifling for some days after the accident; but it gradually increases as the inflammation advances, is thin in its consistency, and mixed with flakes of lymph; coagulates upon the lips of the wound, and oozing through this there will be a thin watery discharge. There is exudation of a large quantity of lymph into the tissues surrounding the joint, which becomes partly organized, forming a hard, firm swelling. The secretion from the wound is now unhealthy, purulent, or tinged with blood, whilst abscesses begin to form around the articulation.

When blood is seen in the synovial discharge, it is an indication that the laminal extremities of the bones have been removed, that their vascular interior is exposed, and that, if the joint affected be one of extensive motion, it will be useless to keep the animal longer in its misery.

Bring the lips of the wound together by suture, which must be either metallic or catgut. If there are any foreign bodies, such as dirt, gravel, or portions of disintegrated tissue in the wound, they must be carefully removed before its lips are brought together. To support the suture, and to prevent the admission of air and germs into the wound, the styptic colloid, shellac, or collodion, must be applied, by being painted on in successive layers with a camel's-hair pencil. The next thing to be done is to place the animal in slings as soon as possible. This is essential to the successful treatment of open joint, as it places the patient in the most favorable position for repose, and by preventing him from making even the attempt to lie down, does away with the danger of reopening the wound. All other local applications, by interfering with the healing process in the wound, are at this stage calculated to do harm.

Wounds upon or near articulations should never be meddled with, by any probing, for the purpose of discovering if there be fracture of the bones. If fracture exist, the lameness will be excessive from the first.

A meddlesome interference with the probe has often caused open joint, when the original injury had not penetrated the synovial membrane.

The constitutional treatment must be that calculated to lessen pain and irritation; a small purgative, combined with opium:

Aloes	℥ iij.
Powdered opium	℥ ss.
Molasses	sufficient to make one ball

to be followed at intervals of four to six hours by one-half-drachm-doses of opium or of aconite; and enemas of warm water, two or three times a day, will be beneficial, unloading the rectum, and enabling the animal to pass fæces without straining.

If the wound heal by these measures, and the inflammation of the joint continue, as in all probability it will, cold must be applied; and the best method of doing this is by irrigation—that is, by allowing a continual stream of cold water to trickle over the surface of the joint. This is easily done by attaching an India-rubber pipe to a faucet, fastening the pipe to a convenient part of the slings, and carrying its free extremity on to the lame limb, and fixing it above the inflamed joint by means of a bandage. If no faucet is convenient, a tub can be fixed in the loft above the horse, or in any part of the stable above the level of the inflamed joint, and the pipe inserted into an aperture at the lower part of the tub, which is to be well supplied with water. A very small stream of water will be sufficient.

If the injury has been inflicted for a longer period than a few hours, when inflammation is already established, and pus has commenced to be formed, to plug up the wound at this stage would only cause the fluid accumulated within the capsule of the joint to burst out at some other spot. The application of the actual cautery, of hot lime, and of the various caustics and astringents, with the view of coagulating the synovia, as recommended by many teachers, writers, and practitioners, cannot be too highly condemned; and it must always be remembered by the practitioner that every wound which has commenced to suppurate must heal by granulations; and that the more perfect formation of these goes on in the deeper-seated parts of the wound—that is to say, that the healing must be from within outwards: the plugging of the outer orifice, while pus is being formed, causes it to accumulate in the joint and sur-

rounding structures, adds to the suffering of the animal, and, in too many cases, causes its death.

The application of a blister to the whole surface of the joint is the most successful treatment that can be adopted if the wound has failed to heal by the primary or adhesive process. The blister acts by removing pain, limiting motion, exciting the formation of healthy granulations, and (as a result of the swelling it produces) causing the approximation of the surfaces of the wound.

The coagulum of synovia which accumulates upon the wound should never be removed, as it prevents the admission of air and of organic germs into the joint, and thus limits the formation of pus.

Many cases when so treated make good recoveries; but if ulceration of the cartilage and removal of the laminal ends of the bones occur (and this change will be indicated by hæmorrhage, or by increased pain and twitching movements of the limb), and if the articulation be one of extensive motion, the attendant will understand that the repair can only be by anchylosis, and that anchylosis in such a joint will render the animal unfit for further use; but if the joint be one of limited motion, the animal may become fit for slow work, even after the joint has been destroyed. The animal's shoes should be removed, provided this be done carefully, and beforo great lameness has manifested itself. If one of the lower articulations, particularly of the fore extremities, be the seat of the lesion, the animal can be made to stand in a tub of cold water (see Fig. 2) and the trouble of affixing the pipe for the purpose of irrigation be avoided.

All cases of open joint require a long period of rest after the wound has healed; and it is generally necessary to blister repeatedly, or even to fire, before the remains of the inflammation excited in the bones and synovial membrane are finally removed.

Several abscesses, some mere points of pus, others of a greater size, form in the exudate which has been formed outside of the cavity of the articulation during the progress of the disease. It may be considered necessary to open them surgically, if they cause increased pain. It may be well do so; but if they are mere accumulations without pain, it is better not to interfere, rather allowing them to burst spontaneously.

The horse should be kept in the slings until he is able to bear a moderate amount of weight upon the affected limb.

During the early period of the disease, the food must be spare, light,

EXPLANATION OF PLATE III.

DISSECTION SHOWING THE SEAT AND INTERNAL APPEARANCE OF WINDGALLS. (PERCIVAL.)

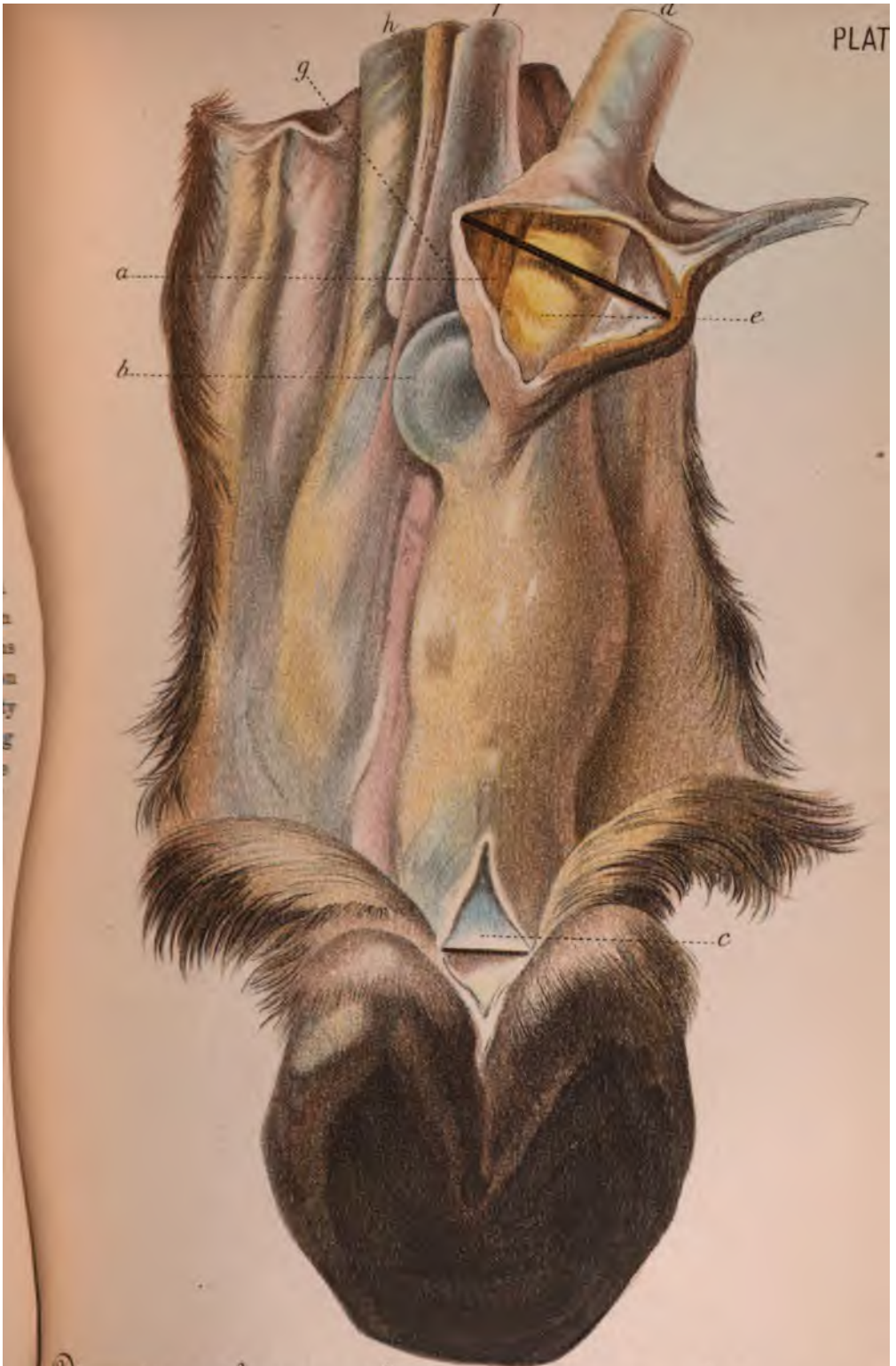
In this plate is represented the near hind leg of the horse, cut off below the hock, inclined a little in its position so as the more fully to expose to view its outer side: the windgalls formed in it showing rather more development on that than on the opposite side.

Two of these tumors (*a* and *b*) are apparent in it in the usual situation, viz., a little above the fetlock. One of them (*a*), which is cut open to expose its interior, is seated about a couple of inches higher than the sesamoid bones, being there lodged in front of the perforatus tendon (*d*) in the interspace between it and the perforans tendon (*e*); which latter seems as though it actually ran through the cavity of the windgall, owing to the circumstance of the bursa having natural attachments around the borders of the tendon. At the time it was cut open this windgall contained full half an ounce of albuminous fluid, of the aspect and consistence of white of egg, excepting that it was of a beautifully bright, pale yellow color, as the stain it has left upon the tendon (at *e*) fully indicates. Its character was truly synovial.

The other fetlock windgall (*b*), situated half an inch lower down, is lodged in front of the perforans tendon, between it and the suspensory ligament (*f*), whose bifurcations afford a habitation for it (at *g*). In its unopened state the windgall assumes the ordinary bluish or grayish cast windgalls, viewed through their parietes, ordinarily present.

The windgall-looking-like cavity within the hollow of the heel (*c*), though in the subject from which the drawing was taken no more than a healthy bursa, represents well enough the *seat* of "windgall of the heel."

PLAT



Dissection showing the seat and internal appearan
of Windgalls

and cooling; but when the fever has abated, it must be of the most nourishing kind, in order to compensate for the great waste of tissue and emaciation which are so characteristic of open joint.

WINDGALLS.

(SEE PLATE III.

Definition.—Windgalls are soft, pulpy swellings in the neighborhood of the fetlock joints. They may vary in size from a pin to a large hen's egg. Fig. 106.



FIG. 106.
External appearance of windgalls.

Etiology.—They more commonly arise from over-exertion and irritation of the parts than from actual sprain. Indeed the fetlock joint is so constructed that it is very rarely sprained.

Treatment.—Apply a stimulating ointment:

Iodide of potassium	℥ ij.
Lard	℥ ij.

or, if preferred, the biniodide of mercury ointment:

Biniodide of mercury	℈ i.
Lard	℥ x.

Even if absorbed, they are very apt to return when the horse is put to work again.

BRUSHING.

Synonyms.—Interfering, cutting.

Definition.—Striking the fetlock by the opposite foot, sometimes causing a contusion only, but more often scratching or abrading the surface. Commonly interfering is between the hind feet only.

Etiology.—Bad shoeing; the clinched point of a nail, not sufficiently turned in or filed, will sometimes lacerate the opposite fetlock badly. Horses when fatigued are more apt to interfere.

Symptoms.—More or less severe transient lameness; if badly struck, the horse will flinch and carry the injured leg off the ground for several steps, and limp for some time before the pain subsides.

Treatment.—A shoe made thick at the heel on the inside, and a boot on the opposite leg. If the fetlock is badly bruised, foment with:

Chloride of ammonium	℥ i.
Nitrate of potassium	℥ ij.
Water	℥ xvi.

Thoroughly dry after each washing, and if cut apply Pinus canadensis or tar.

SPEEDY-CUT.

Definition.—This is an injury caused by the one fore-foot wounding the opposite leg immediately below, and sometimes just above, the knee. It is usually inflicted at the gallop, when the horse has begun to tire.

Symptoms.—Heat and swelling, accompanied by the formation of pus, about the injured part, which is very sensitive. After a day or two, an abscess may appear, or the swelling may feel like a sac containing pus.

Treatment.—If pus is present, open the abscess freely, to give it vent; bathe the parts with warm water, and afterward with a weak solution of:

Acetate of zinc	gr. xxv.
Water	1 pint

Use as soon as the acetate is dissolved.

If left alone, the abscess will often become hard; if it is desirable to

break up this deposit, blister with biniodide of mercury, and open at the lowest point by a horizontal incision. Then apply a chamois-skin bandage, wet with oil and water, moderately tight, to induce absorption. It is advisable to use a boot extending as high as the knee on horses liable to speedy-cut.

SHOULDER SLIP.

Definition.—Inflammation of the muscles and tendons of the



FIG. 107.

MUSCLES OF THE INSIDE OF THE SCAPULA INVOLVED IN SHOULDER SLIP.

1, 1. The antea spinatus.
2. Subscapularis.
3. Teres internus.
4. Caput magnum of triceps extensor pedis.
5. Scapulo-ulnarius.
6. A distinct muscle, without a name.
7. A portion of the caput medium.
8. Humeralis.
9. Caput parvum.
10. Coraco-humeralis.
11. Flexor brachii.



FIG. 108.

MUSCLES OF THE OUTER SIDE OF THE SHOULDER, ATROPHIED IN SHOULDER SLIP.

a. Postea spinatus.
b. Antea spinatis.
c. Triceps.
d. Teres externus.
e. Flexor brachii.
f. Extensors of the forearm.
g. Flexors of the forearm.

shoulder joint resulting in atrophy. See Fig. 107 and Fig. 108 for muscles involved in shoulder slip.

Etiology.—Shoulder slip occurs only in horses which are obliged to work on uneven ground, as in plowing.

Symptoms.—A wasting away of the shoulder, accompanied by an increasing lameness. The loss of muscle leaves a hollow space upon both sides of the scapular spine.

Treatment.—If the inflammation is detected before the muscles become atrophied, fomentations:

Chloride of ammonium,
Nitrate of potassium.....āā ʒ iiss
Water.....1 pint
Use as soon as dissolved.

A dose of physic, five grains of aloes with linseed meal and molasses to form a ball, and subsequently keeping the bowels free by green forage, and removal of the shoes is proper treatment. After the muscles are shrunken, stimulating blister:

Cantharides..... ʒ i.
Lard..... ʒ x.

or,

Binodide of mercury..... ʒ i.
Lard..... ʒ xvi.

and turning out to grass for a long rest is best.

ELBOW LAMENESS.

Etiology.—Disease of the joint, sprain of the lateral ligaments, or rupture of the triceps muscle are the ordinary causes of elbow lameness.

Symptoms.—The lameness is excessive. When the ligaments are sprained or the triceps injured, the diagnosis of the seat of lameness is easy, for there will be swelling, pain, and heat, in addition to difficulty in moving the articulation. When the internal ligament is injured, the

horse stands with his foot and limb thrown outwards. This he does to prevent, as much as possible, the injured parts being pressed upon by the pectoral muscles, and when the triceps is the seat of the injury, the forearm is flexed upon the humerus; the action of the flexor brachii being now unopposed, the knee is elevated, the leg flexed from the knee downwards, the toe of the foot touching the ground, and the limb semi-pendulous. When the horse is made to move, he *drops* considerably, and seems in danger of falling at every step he takes, the limb itself almost bending double when any weight is thrown upon it. This excessive *dropping*, during progression, in characteristic of elbow-joint lameness, even when there are no external signs, such as heat, swelling, or pain, visible. Fig. 109 gives the anatomy of the joint.



FIG. 109.

Posterior view of left elbow joint.

A. Inferior third of the humerus.
B. B. External and internal condyles.
C. Olecranon process of ulna.
D. Radius.
1. External lateral ligament.
2. Internal lateral ligament.
3, 3, Fibro-cartilaginous substance uniting the ulna to the radius.

Treatment.—Frequent fomentations with warm or not water in which a little laudanum may be poured. In a day or two, cold applications may be made, or they may be made from the outset if preferred.

A full dose of six grains of aloes may be given. The swelling may be afterwards treated by rubbing with:

Powdered cantharides..... ..... ℥ i.
Lard..... ℥ xij.
Mix with gentle heat.

CAPPED KNEE.

Definition.—Swelling of the bursa of the extensor metacarpi magnus muscle.

Etiology.—Usually produced by blows upon the knees or by the entrance of thorns into the knee.

Symptoms.—Stiffness and pain in the knee with heat, indicating inflammation, with a resulting fluctuating swelling. Fig. 110.



FIG. 110.
Capped knee, fore leg.

Treatment.—This swelling may either be punctured at once, or its reduction attempted by the application of blisters. Of course if a thorn can be detected, it must be at once removed. Blisters, when sufficiently strong,

Powdered cantharides..... ..... ℥ i.
Lard..... ℥ vi.

often cause the reduction of these swellings by producing an exudation of lymph into the distended sac, converting the soft, fluctuating swelling into a hardish, indurated mass, which is gradually removed by absorption. But if blisters, with moderately firm pressure after the soreness of the blister has passed away, have no effect in reducing the swelling, the practitioner need not hesitate to puncture and allow the contained fluid

to escape. The puncture should be made at the lowest margin of the swelling, and upon its inner side, by a transverse incision, in order to blemish as little as possible. After the puncture is made and the fluid pressed out, the walls of the sac must be kept in apposition by means of a flannel bandage, rolled round the knee from above downwards, until they become united by the adhesive inflammation. The bandage should not be disturbed for five or six days if no inconvenience is caused to the patient; but if any signs of pain are manifested, it should be removed and readjusted. The puncture in the skin must be kept open (and the best plan to do this is to insert a small piece of lint or tow into its orifice, allowing it to remain in for a few hours), in order to allow the escape of any fluid which might collect in the sac. The bandage is placed so as not to cover the wound. There is no danger to be apprehended from opening this bursa, sufficient inflammation is excited without injecting iodine or any other irritant.

STIFLE JOINT LAMENESS.

Symptoms.—When the true stifle-joint is affected, the leg throughout is held, when at rest, in a flexed condition, the toe resting on the ground; but as soon as the sufferer moves the limb it is quickly extended and rigid; at each step the heels first touch the ground, the body being elevated greatly, as the weight is carried over the limb. When the minor joint is diseased, the limb, as in the preceding case, is held, during rest, in a state of semiflexion; in movement, the toe drags on the ground, or is carried round in a swinging form; and in the worst cases—probably from extension of the disease—the action assumes the form last described. Swelling, acute irritative fever, and intense pain, sometimes mark these cases, from which the animal dies, or has to be destroyed. In old horses it is not uncommon to find eburnation of this joint, the existence of which may have been suspected by the enlarged condition of the synovia capsule during life. For the anatomy of the stifle joint see Figs. 111 and 112.

Treatment.—Cold applications until the inflammation subsides and then stimulating embrocations: that recommended below for sprain of the fetlock joint. Or, if preferred:



FIG. 111.

POSTERIOR VIEW OF STIFLE JOINT.

A. Inferior third of femur.
B. B. Condyles.
D. Superior third of the tibia.
E. Fibula.
F. Patella.
1. Internal lateral ligament of the patella.
2. External lateral ligament of the femoro-tibial articulation.
3. Internal lateral ligament of the femoro-tibial articulation.
4. Posterior crucial ligament.
5. 5. Semilunar cartilages.



FIG. 112.

EXTERNAL VIEW OF THE LEFT STIFLE JOINT.

A. Femur.
B. External condyle of femur.
C. Trochlea.
D. Tibia.
E. Fibula.
F. Patella.
1. Strong band of fibres.
2. External lateral ligament, or the capsular ligament, connecting the patella with the external condyle.
3. 3. Great ligament of the patella.
4. 4. External ligament of the patella.
5. 5. Semilunar fibro-cartilages.

Mercurial ointment..... ℥ i.
Oil of origanum..... ʒ ss.
Camphor..... ℥ i.
Olive oil..... ℥ iv.

SPRAIN OF THE FETLOCK JOINT.

Symptoms.—Heat, pain, and tenderness on manipulation, a hesitancy to put the foot to the ground, and finally abandoning the attempt and hopping on three legs. It is a rare form of lameness.

Treatment.—Throw up the horse from all work, give perfect rest,

bind up the joint loosely with muslin bandages, and keep wet with cold water until the inflammation subsides, afterward rub twice daily for a week with:

Oil of turpentine,
Tincture of cantharides.....āā ℥ iss.

Give very gentle work for some time.

SPRAIN OF THE FLEXOR TENDONS.

Synonym.—Sprain of the back sinews.

Etiology.—Too heavy loads, especially when shod with high toe calks.

Symptoms.—There will be heat and swelling in the part; very often during the earlier stages, the ligament can be felt swollen, prominent, and bulging, the tendons themselves being quite normal; when pressed upon, the horse evinces pain; stands with the leg upright, and moves it stiffly, digging his toe into the ground. When in the hind leg, flexion is very imperfectly performed; he seems to throw the limb behind him as he lifts it from the ground, and the fetlock and hock are not flexed as in sound action. When the tendons themselves are involved, they will be found swollen upwards and downwards from the seat of the original injury; and this extension of the swelling prevents their gliding through their thecæ, particularly the thecæ situated in the carpal or tarsal fossæ.

To detect very slight sprains, especially if situated in a hind leg, it will often be necessary to compare the thickness of both legs by careful manipulation, as the swelling can only be detected in that way, on account of the coarse hair and thick skin of cart-horses' legs. In the better bred animal, a difference in the thickness can easily be seen as well as felt.

The special treatment required for this lameness is the application of the high-heeled shoe, in order to throw the tendons into a state of relaxation, and a *long* period of rest. In chronic cases, where shortening has permanently taken place, the operation of tenotomy must be performed.

Many horses with contraction of the tendons will perform very light work moderately well if a piece of iron is attached to the toe of the shoe, projecting an inch or two in front of it, and slightly turned up at its

anterior part. This acts as a lever upon the toe, forcing the heel downwards, and prevents "knuckling over" on the front of the fetlock-joint.

Tenotomy, or division of the tendons, is thus performed:—The animal is first cast, the lame leg, being on the ground, is loosed from the hobbles, and secured by a rope-strap around the fetlock held by an assistant. A small wound is then made about the middle of the leg on the inner side in a longitudinal direction, directly over the groove or depression formed between the bone and tendons, and the attachment by subcutaneous tissue between the tendons and the suspensory ligament also must be cut through as far as the skin below, the knife being used flatwise. A probe-pointed knife is then inserted flatwise as far as the skin on the lower side, then turned edge towards the tendons, when by gradual cutting they are divided. The existence of old-standing adhesions about the tendons and fetlock-joint may prevent straightening of the limb, but if the operator places his knee against the front of the cannon bone, and by pulling at the foot forwards, the obstructions will be broken down. Only one skin wound is necessary; two orifices render the recovery tardy and awkward. Union of the lips is secured by sutures, and cold-water bandages may be applied afterwards, or the antiseptic treatment followed. The animal may be placed in slings, and the head tied up, the feet being divested of shoes, and hoofs trimmed to proper proportions. By degress the animal brings the heels to the ground and bears weight upon the foot, and union is usually effected in two months, or thereabouts, sufficiently to enable the animal to go to ordinary work.

The operation, although promising in itself, and successful in restoring the limb to its natural position, very frequently proves a source of disappointment, from the fact that the reparative material, which is thrown out between the ends of the divided tendons, gradually contracts, whereby the tendons are made as short as before it has been performed. In the hind leg this contraction is the usual consequence, and the tendency to it has to be overcome by a lever at the toe of the shoe. This often arrests, but seldom finally prevents it. In the fore extremity the operation is much more successful, the limb maintaining its natural condition for years afterwards.

SPRAIN OF THE SUSPENSORY LIGAMENT.

Symptoms.—Sprain, or simple extension of the suspensory ligament, according to the extent of injury, gives rise to lameness, swelling along

the course of the structures, with heat, pain, and tenderness on pressure; while the animal endeavors to give ease to the part by flexing the fetlock-joint, and resting or walking on the toe of the foot, the weight being sustained by the flexor muscles and tendons. When rupture takes place, it may occur at the broad part above the bifurcation, across one or both of the branches; or it may be torn direct from one or both of its attachments at the sesamoid bones. Wherever the tendon is ruptured the effects are the same; the fetlock descends to the ground, the toe pointing upwards and the sole forwards, exhibiting the condition known as "*break down.*" As the ligament is common to fore and hind legs, any one of them may be the seat of lameness. As a rule, hunters and race-horses are most liable to it as arising in the fore-limbs, while other animals, of heavier breeds, exhibit it in the hind legs.

The injury is a very serious one; but with a long rest and proper treatment a horse so injured may become sufficiently sound to perform moderate work for many years. Yet there is always a weakness left, which must be considered an unsoundness, as it may at any time cause lameness, particularly if the animal be called upon to do a little extra work.

The marks of the injury will always remain and exhibit themselves in a permanent thickening which may be felt close to the large cannon bone, or on any part of the ligament.

Treatment.—For simple sprain apply cold water, put on a bandage loosely, and keep it constantly wet. Make a fine roll of tow or muslin and bind it firmly under the fetlock pad so as completely to fill up the hollow of the heel and support the fetlock; continue the bandage well up to the knee. If the horse will lie down, it is the best way of resting the limb, otherwise it is best to put him into slings. A long rest from work is indispensable to a recovery.

SWELLED LEGS.

Synonyms.—Stocking; Œdema of the legs.

Definition.—A dropsical affection, usually of mild form. The name swelled legs indicates very clearly the appearance of this affection.

Etiology.—Sometimes arising from deficient action of the kidneys,

but much more commonly from the vessels of the legs not acting sufficiently when the animal is at rest.

Symptoms.—Swelling of the lower part of the legs, giving a coarse appearance to them, and usually most apparent in the morning.

Treatment.—If caused by want of exercise, a half hour's or an hour's walk will cause aborption. The system may need the use of tonics as:

Sulphate of iron..... ℥ i.

twice a day in the food, or,

Sulphate of quinine ..... ℥ i.
Gentian... ..... ℥ ij.
Linseed meal,
Molasses.....āā sufficient.
In a ball daily.

Or,

Sulphate of iron..... ℥ i.
Gentian..... ℥ ij.
Honey..... ℥ xvi.
Two tablespoonfuls twice daily as an electuary.

Give some simple diuretic, as:

Nitrate of potassium ..... ℥ ij.
Dissolved in water

to act on the kidneys.

LYMPHANGITIS.

Synonyms.—Weed; Inflammatory Œdema.

Definition.—Inflammation of the lymphatic glands, usually of the hind legs, accompanied by a disturbance of the functions of the absorbents and blood-vessels.

Etiology.—Over-feeding with too little regular exercise. Hereditary

predisposition, unaccustomed and prolonged exposure to wet and cold after severe work.

Symptoms.—Mr. Haycock, who was first to give this disease a scientific name, very graphically describes a case of it which occurred in his practice. He says:—"The horse is standing in the stable on three legs, the left hind limb being held with the foot from the ground. Great anxiety is depicted on the animal's countenance, and he frequently looks round at the limb held up. The respirations are forty-eight per minute; the pulse ninety-six, and hard and cord-like to the touch. The nostrils are dilated to their full extent, and the perspiration rolls in drops from the sides of the abdomen, the shoulders, and the thighs. The affected limb is greatly distended upon its inner surface, from its junction with the body to the very foot. The lymphatic glands are swollen into large lumps or masses, and towards them, in all directions, run a great number of lymphatic vessels, enlarged to the size of a thick quill. These enlarged vessels exist on the outer as well as the inner side of the limb. The surface of the swelling is covered with a serous exudation: the mouth is dry and clammy; and great desire is evinced for cold water."

Horses that have once been attacked by lymphangitis are liable to a recurrence of the malady, and generally one attack succeeds another periodically, until the limb assumes an enlarged or distended condition termed elephantiasis.

Treatment.—Fomentations of warm water to which a little laudanum has been added, to the affected limb, to reduce the swelling, and the administration of a cathartic:

Aloes..... 3 vi.
Ginger..... 3 ij.
Molasses.....sufficient
To make one ball

constitute nearly all the treatment that is required. After the cathartic has operated, diuretic remedies may be given with advantage:

Powdered digitalis..... 3 i
Nitrate of potassium..... 3 ij.
Linseed meal,
Molassess.....āā sufficient

Or,

Nitrate of potassium ..... ʒ ij.
Dissolve in water and give twice a day

and should the fever be very high, the pulse hard, and the animal showing signs of much pain and restlessness, tincture of aconite is to be repeatedly administered. Some practitioners are in the habit of giving a small cathartic, and sending the horse to ordinary work whilst suffering from this malady. Such practice is irrational, and defeats its own object; for exercise, though carefully regulated, if given early in the disease, causes the swelling to assume a permanency of character which it is difficult to remove. Exercise certainly dissipates the swelling at the time; but after the patient has stood for a few hours, the swelling returns, and it is no less curious than true, that each fresh exudation tends more and more to become organized.

As a powerful stimulant to the vessels of the skin inducing a general warmth over the surface of the body, tincture of arnica, in doses varying from one to two ounces, can be given with advantage.

ELEPHANTIASIS.

Definition.—This is a condition of excess of development of the cutaneous and subcutaneous tissues of a diffuse character, usually involving the larger proportion of these structures of an entire limb.

Etiology.—This condition of steady hypertrophy of skin and other associated structures appears in all instances directly dependent on lymphangitis, the extent and rapidity of the changes being in direct relation to the severity of the inflammation. Although the hyperplastic cutaneous activities are only set in motion by the inflammatory affection of the lymphatics, and while every fresh attack may give a renewed impetus to the development of particular tissue-elements, the hyperplastic changes, when once started, seem to go on even between these repeated onsets of lymphangitis, only receiving a fresh and more powerful impetus on the occasion of each attack.

Symptoms.—The first appearance of the disease is a swelling of the subcutaneous tissue, the true skin becoming involved secondarily. When

affected, the skin becomes thickened, somewhat hardened and more difficult to move on the subcutaneous tissue; it is dry and coriaceous, occasionally scaly, and falls into folds and fissures which in cases of long standing may chap and suppurate. This thickening of cutaneous and subcutaneous parts, after a time, causes much alteration of the limb and deformity, with impaired power of motion. (Fig. 113.)



FIG. 113.
Elephantiasis in the Horse.

Treatment.—This may be palliative; but seldom, when once established, is the condition reversed. Of all which have been recommended and tried, a judicious combination of drastic cathartics and diuretic medicine with a rather liberal use of tonics, vegetable and mineral, together with the employment of daily inunctions with a compound of mercurial and iodine ointment, may be productive of good. The more heroic treatment, by the local use of cantharides blisters, issues, or the actual cautery, has also been tried, but generally with unfortunate results. Once the disease is established, it may be classed among the incurables.

CHAPTER X.

DISEASES OF THE FEET.

Prick of the Foot, Picking up Nails, Puncture of the Frog and Sole, Corns, Quittor, Sandcracks, False Quarter, Seedy Toe, Thrush, Frush, Canker, Navicular Disease, Laminitis, Founder, Inflammation of the Feet, Sidebones, Villitis, Inflammation of the Coronet, Carbuncle of Coronet, Tread, Overreach.

The diseases of the feet and their intelligent treatment can be better understood by a careful study of the figures here given as preliminary to the consideration of the subject matter of this chapter. In Fig. 114 is



FIG. 114.
External appearance of the Foot.



FIG. 115
Ground surface of the foot; *A*, sole; *B*, bars; *C*, Frog; *D*, the ordinary seat of corns; *E*, Crust or wall.

shown the outer appearance of the hoof, the horny crust. Fig. 115 is the ground surface of the foot, when properly prepared for shoeing

Fig. 116 shows the relation of the bones of the lower leg to the foot bones:—*a*, cannon bone; *b*, large pastern bone; *c*, small pastern bone; *d*, pedal bone; *e*, navicular bone; *f*, insertion of the extensor pedis tendon into the coronary process of the pedal bone; *g*, insertion of the flexor pedis perforans, passing under the navicular bone, to gain insertion into the sole of the pedal bone; *h*, elastic frog; *i*, horny frog; *j*, hoof; *k*, coronet.



FIG. 116.

The pastern and foot divided through the centre.

Fig. 117 exhibits the delicate laminæ within the wall of the foot:—*a*, sensitive frog; *b*, sensitive bars: white line between the bars and frog representing the part of the foot which secretes the horny commissure that unites the bars and frog; *c*, sensitive sole; *d*, heels; *e*, fissure of the frog; *ff*, reflection of the sensitive laminæ forming the bars; *g*, reflection of the coronet forming the frog. The spongy substance, represented at the left between *e-a* and *b*, show that the subject whence this drawing was taken was only saved by death from an attack of canker.

Fig. 118, the bottom of the foot after all the insensitive sole has been removed:—*a*, secreting coronet; *b*, sensitive laminæ; *c*, reflection of the coronet going to form the sensitive frog; *d*, reflection of the sensitive laminæ going to form the sensitive bars; *e*, toe; *f*, quarters; *g*, heels.

In Fig. 119 we have a fine representation of the bones and other parts of the foot after it has been cut off just below the coronet:—*a*, elastic frog; *bb*, posterior portion of the lateral cartilages; *cc*, anterior portion

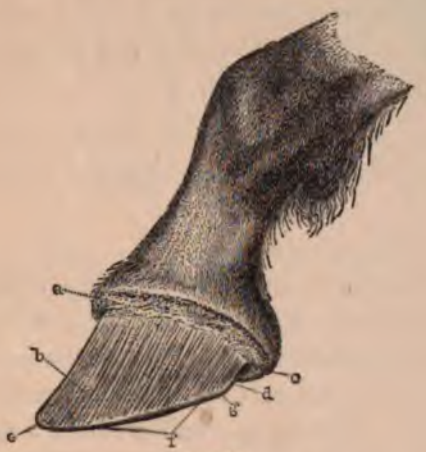


Fig. 117.
Sensitive laminæ of the foot.

of the lateral cartilages cut through; *a*, flexor pedis perforans tendon, running under the navicular bone. but above the elastic frog; *e*, navicu-



Fig. 118.
The bottom of the foot after all the insensitive sole has been removed.



Fig. 119.
The hoof divided below the coronet.

lar bone, the anterior portion of which has been divided; *f*, superior surface of the pedal bone, showing the indentations for the reception of

the prominences at the inferior extremity of the small pastern bone; *g*, in the separation of the hoof a removal has taken place of the coronary process, which consequently projects above the horny box in the living subject; *h*, interweaving of the sensitive and of the horny or insensitive laminæ; the dark lines representing the sensitive laminæ, and the white the horny laminæ, which form the inner wall of the crust; *i*, outer wall of the crust, consisting of dark horn.

PRICK OF THE FOOT.

Synonyms.—Picking up a nail.

Etiology.—Pricking is caused by nails actually penetrating the sensitive laminæ which line the interior of the horny substance of the foot, or by their being driven into the soft horn which surrounds them. In the latter case, it may be several days, or even a week or two, before the lameness disappears. Picking up a nail produces a similar wound, and is liable to occur at any time a horse is in use. An injury of this kind should be promptly treated, or it may result in serious trouble and cause tetanus.

When the sensitive sole is injured by any such cause, inflammation almost always occurs, terminating in the formation of pus which, unless aided to escape, may burrow its way up and form an opening upon the coronet, producing quittor.

Symptoms.—Lameness.

Treatment.—If not readily seen, the exact point of the lameness may be detected by pinching around the foot with a pair of pincers, one side being against the outside, while the other presses the sole inside of the shoe. The injured spot being supposed to be found, draw the nails from the shoe, carefully watching each as it comes out. If one appears to be wet, it is probably the cause of the trouble.

In all cases it is essential to pare out freely, not merely the seat of the puncture, but the surrounding sole for a considerable distance, with the view of affording an easy exit for any matter which may form in the insensitive sole. The foot should then be bathed in hot water for an hour.

Having taken these precautionary measures, it is, in general, safe in cases which are treated *immediately* after the occurrence of the injury, *i. e.*, before inflammation has begun (but not otherwise), to close the puncture at once by the application of tow and tar for the purpose of ex-

cluding the air and thereby lessening the chances of the occurrence of inflammation. The shoe must be nailed on lightly in order to secure the stopping in its place. Perfect rest is essential. In favorable cases, the horse will be fit for work in a few days. Very few cases, however, are taken sufficiently early to render the closing of the wound advisable.

As a general rule, inflammation will have set in and the formation of matter begun before the injury is noticed. The evil with which we have then to deal is the confinement of the pus in the interior of the foot. In addition to paring out the sole, recourse must be had to poultices of linseed meal:

Ground linseed..... ..... ℥ ij.
Olive oil..... ..... ʒ ij.
Boiling water..... .... ℥ v.

Mix the ground linseed gradually with the water and then add the oil with constant stirring

with the view of modifying the inflammation and relieving the pain.

When these measures are early and efficiently taken, injuries of the sensitive sole seldom prove either serious or tedious. The insensitive sole, however, having been freely removed, the horse will not be fit for work until nature has re-supplied a sufficient quantity of it for the protection of the foot, unless an artificial covering, such as a leather shoe covering the entire sole, is provided. When, however, the wound is more serious and does not yield to this treatment, lockjaw may supervene, or even set in within four or five days. For further directions in such cases, see the article on Tetanus.

PUNCTURES OF THE FROG AND SOLE.

Punctures of the frog are similar in character with those of the sole and require similar treatment. They nearly always arise from picking up a nail. When taken in time, they are not serious and yield to treatment even more readily than injuries of the sole.

If neglected, however, they are apt to lead to extensive disease of the frog, and canker may be the possible result. In rare cases, the navicular bone may be punctured, perfect recovery from which can never be expected.

CORNS.

Definition.—Corns are bruises of the sole, usually occurring in the angle formed by the bars and the crust in front of the heel. They rarely come on the hind feet. Corns probably are formed suddenly by a bruise on the soft parts in the location named, and consist at first simply of serum and lymph, or of exuded blood; very similar in nature to a blood blister in the human skin.

Etiology.—An indirect but common cause of corns is bad shoeing, the practice of excessive filing of the crust, to make a good-looking foot, and also the removal of the bars. In rare cases they may be caused by

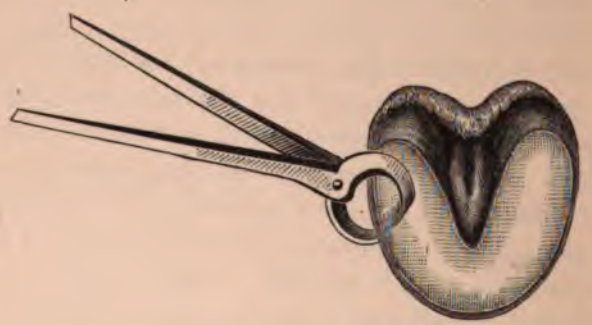


FIG. 120.

Method of finding a corn.

treading upon a stone. Paring out the seat of the corn, by which the sensitive sole becomes exposed to injury from bruises and from the accumulation of dirt and gravel under the shoe, in the hollow so made, may perpetuate the difficulty.

Symptoms.—Lameness, more or less pronounced. To find the exact location of a corn, apply a pair of pincers to the hoof as shown in Fig. 120, and apply firm pressure from place to place until the flinching of the horse shows the right spot has been found.

Treatment.—The treatment of a corn, in its early stage, consists simply in removing the cause, which is almost always undue pressure of the shoe. Mayhew divides corns into four kinds, viz., the old, the new,

the sappy, and the suppurating; and as each has its characteristics and appropriate treatment, his classification may be accepted.

Old corns are not commonly serious, and are mainly to be looked out for in buying a horse.

In very slight cases, not causing lameness, it will be sufficient to cut away with the knife the black spot which indicates the seat of the corn, and apply shoes somewhat longer than the crust, and somewhat broad in the web at the heels, *i. e.*, slighly projecting over the crust and bars.

A new corn consists of exuded blood effused into the soft horn, and is of a bright scarlet color. If it produces lameness, it should be pared out carefully and *without injury to the crust or bars.* After which a three-quarter-shoe, or a shoe so narrow in the web at the heel that it may rest only on the crust, should be applied. Either of these measures will remove the cause, viz., pressure.

A sappy corn is treated in the same way.

A suppurating corn is a serious evil, and produces extreme lameness. Take off the shoe and apply a linseed meal poultices:

Ground linseed..... ℥ ij.
Olive oil ..... ʒ ij.
Boiling water..... ℥ v.

Mix the ground linseed gradually with the water, and then add the oil with constant stirring.

After twelve to twenty-four hours, remove the poultice, and cut away the softened horn until it yields easily to the pressure of the finger, and then cut into the corn and give vent to the confined pus. Poultice again for a day or two, as may seem to be needed. Then wash clean and apply some astringent and antiseptic, as sulphate of zinc:

Sulphate of zinc,
Acetate of lead.....āā ʒ ij.
Water.....1 pint.

or, if preferred:

Carbolic acid..... ʒ i.
Water..... ℥ vi. to xij.

Shake well.

Allow the horse perfect rest, and examine the foot from time to time, to see that the new horn is growing over the spot. It is well, when the shoe is first put on and the horse used, to protect to foot with a leathern sole

For those who desire to use a corn salve, the following preparation, recommended by Chawner, is as good as any:

Tar,
Beeswax,
Honey,
Glycerin.....āā ℥ iij.
Lard.....lb. 1½.
Nitric acid.....℥ ij.

"Melt the lard and beeswax together, stir in the tar and other ingredients and stir until cold."

It is essential to bear in mind that though, as a temporary measure, the formation of corns by undue pressure may be prevented by paring out, and by the use of special shoes, yet the only real means of preventing a recurrence of the disease consists in the maintenance of a good, sound unrasped crust, and unpared bars, on which a well-fitting shoe of the proper length can rest firmly and securely, without making undue pressure upon the seat of the corn. Corns, when treated only by paring out, even though they may by such means be got rid of for a time, generally reappear.

QUITTOR.

Synonym.—Fistula of the coronet.

Definition.—Quittor is described by Percivall as a hard, conical tumor, hot and tender on pressure; indeed, sometimes so painful as to occasion considerable lameness. It is an inflammation of the cartilages of the foot, accompanied by a profuse discharge of pus, which burrows in various directions, making fistulous channels, with usually several openings upon the quarters and heels of the coronet.

Etiology.—The most common cause is a severe tread or bruise from some other cause on the coronet. It may also arise from a neglected corn, or from a bruise or prick of the sole.

Symptoms.—Usually lameness is very pronounced. The coronet swells, sometimes to an enormous size, is hard to the touch. After a time, the pus breaks through and is discharged as a thick, creamy fluid.

Treatment.—Whatever may have been the cause, the great mischief arises, not so much from the original injury, as from the tendency of the pus or matter to burrow and form sinuses in the interior of the foot. Therefore, in all cases, our first aim must be to afford an easy and depending exit to the pus.

Remove the shoe, and pare the sole clean, to see if the quittor has been caused by a wound in that part. If it has, cut down on the brim and open a channel for the pus to escape downward. If no sinuses have formed, a linseed meal poultice:

Linseed meal ..... ℥ iv.
Olive oil..... ℥ ss.
Boiling water..... ℥ x.

Mix the linseed meal gradually with the water, and then add the oil with constant stirring

and subsequent application of an astringent lotion:

Sulphate of zinc,
Acetate of lead .....āā ʒ ij.
Water..... .....1 pint

will generally effect a cure. If sinuses have formed, they must be opened freely, and either probed with the actual cautery, or with a mixture of powdered corrosive sublimate and flour, viz.:

Corrosive chloride of mercury..... ʒ i.
Flour..... ℥ i.

Or, a still better practice is to syringe it out with a mixture of:

Corrosive chloride of mercury..... ʒ i.
Water..... ℥ i.
Hydrochloric acid..... .....3 or 4 drops

The latter is also the most simple method.

A thorough application of either of them will be followed by the

sloughing of the diseased membrane in a day or two. The animal should then begin to mend, and in two or three weeks ought to be again fit for work. The application of the caustic should not be repeated more than once or twice.

When the internal disease is removed, the treatment of the mere sore at the coronet is easy. In fact, beyond keeping it clean, applying a simple cold-water dressing, and occasionally an astringent lotion, as:

Collodion	℥ x.
Carbolic acid	℥ i.
Tannin	ʒ iv.

little more need be done. Sometimes, however, there is a great tendency to the growth of unhealthy granulations around the sore, which will require to be checked by caustics or removed by the knife.

Great care must in all cases be taken to prevent the external sore from healing over before the internal disease is thoroughly eradicated. From the great vascularity of the parts in the neighborhood of the coronet, there is always an over-tendency to the healing action.

SANDCRACKS.

Definition.—A sandcrack is a longitudinal division in the fibres of the wall of the hoof, amounting to a flaw simply, or else to a cleft or fissure through the substance of the horn. It is usually found on the inside in the fore-feet (quarter-crack, Fig. 121) and in front in the hind feet (toe-crack, Fig. 122).

Etiology.—In most cases, the fissure is due to brittleness of the crust. This brittleness may be constitutional, some horses being evidently predisposed to it, but it is more often due to the evil practice of cutting away the sole, and of rasping the crust. The fissure may also be a result of contraction at the heels. Such contraction may arise from natural causes, but it is certain to be aggravated, if not produced, by the practice of cutting away the bars, and so-called "opening" the heels.

Symptoms.—A sandcrack does not ordinarily cause lameness until it has become sufficiently deep to expose the sensitive laminæ, or until it has extended to the coronary band. It is then excessively painful, and

the lameness is extreme; the crack may be seen to open as the horse raises his foot, and close as he puts it down.



FIG. 121.
Quarter-Crack.



FIG. 122.
Toe-Crack.

Treatment.—With a knife scrape the sharp edges of the crack to its bottom, until a clean groove has been formed. Wash out with white lotion:

Sulphate of zinc,
Acetate of lead.....āā ʒ ij.
Tannin.....℥ ss.
Water.....1 pint.

In all cases blister the coronet with:

Cantharides in powder.....℥ ss.
Lard.....℥ vi.

rubbing it in every two or three days, to stimulate the formation of new horn.

If the crack does not extend the entire length of the hoof, draw a

deep furrow with a red-hot iron, at either end or both; not deep enough, however, to cause pain, but sufficient to stop the crack from extending.

Sandcrack, when it occurs at the toe, usually extends the entire length of the foot, and exposes the flesh, which is apt to become granulated. In no case should these granulations be removed by caustic, which only inflames the tissues more than before. When they have appeared, cut them away with one stroke of a sharp knife. The loss of blood which follows will be of advantage to the parts. Bathe with solution of chloride of zinc two or three times daily. When the inflammation has subsided, the fissure may be drawn together by cutting a niche, about a quarter of an inch deep, half or three-quarters of an inch from



Fig. 123.
Punch for closing sandcrack.



Fig. 124.
Clasps for sandcrack.



Fig. 125.
Pincers for closing sandcrack.

the crack on each side, and driving a flat-horse nail through from one to the other; draw the ends together tight and clinch them with pincers and scrape smooth. It should be remembered that the horn is thickest below and becomes thinner toward the coronet, so that nails cannot be driven very far up on the foot. Through all the treatment keep the foot dry.

When, however, the fissure occurs on the side of the foot, this treatment is inapplicable, as the crust in that part is too thin to admit with safety the insertion of a nail.

A very simple and easily applied clasp for the treatment is here shown in Fig. 124. It may be obtained, together with the necessary appliances for inserting and clinching it, from almost any surgical instrument maker. The punch, Fig. 123, is heated to redness and applied so as to burn a hole on each side of the crack. The clasp, Fig. 124, is then taken in the pincers, Fig. 125, inserted in the holes, and squeezed together until the crack is closed.

The treatment of sandcrack, as regards shoeing, consists in removing the shoes altogether. When the fissure is at the side, a three-quarter bar shoe may often be beneficially applied. Tips are an almost certain remedy for sandcrack. Sandcracks can always be got rid of, as long as the coronary band remains entire; but if by neglect the disease is allowed to involve the secreting substance, false quarter, or a permanent separation in the crust at the quarter, may probably be the result.

Sandcracks being more or less constitutional, are apt to recur.

FALSE QUARTER.

Definition.—When any part of the coronary band is involved in serious inflammation, its ordinary secretions are necessarily arrested. If the inflammation is long continued, the vitality of the portion of the band affected becomes wholly destroyed. As the crust is secreted from the coronary band, it necessarily follows that there must be a break, or separation in the crust immediately below the place where the injury to the secreting surface has occurred. This separation is called false quarter. Fig. 126.

Etiology.—The disease in the coronary band is usually the result of a tread, or of quittor, or sandcrack, or of any external injury sufficient to produce violent inflammation in the secreting substance, and consequent arrest or its secretien.

Treatment.—As the secreting surface, when once destroyed, cannot be restored, there is no cure, properly so called, for false quarter. All that can be done is to restrict the disease within the narrowest possible

limits, and in adopting such measures of relief as may enable us most speedily to work the animal again.

As the treatment of those diseases which terminate in false quarter has elsewhere been given, we have only to deal with the result, namely, the permanent separation in the crust. The earlier stage is usually accompanied with lameness, and the horse must be relieved from all work. The detached portion of the horn on the side of the fissure must be removed, and the fissure itself kept scrupulously clean; for the admission of dirt or gravel will produce irritation and delay the cure. If much pain is present, it is advisable to apply a poultice, says:

Linseed meal,
Bran ....āā oz. iij
Boiling water..... .....1 pint.
Mix gradually.

As soon as the acute symptoms have subsided, a plaster of tow and tar should be applied to the fissure, with a view to keep out the dirt, and



FIG. 126.
False Quarter.

stimulate the parts to throw out new material. In a few weeks the lameness will probably subside, and with the assistance of a three-quarter shoe, which will prevent undue pressure and concussion on the seat of the disease, the horse may be worked again.

In the course of time, although the legitimate secretion of the coronary band is not restored, Nature will, from the surrounding parts, throw out a species of spurious horn, which will sufficiently protect the sensitive parts immediately under the seat of injury, the horse will be again sound, for all practical purposes, and eventually the aid of a three-quarter shoe may be dispensed with.

SEEDY TOE.

Definition.—This term is applied to a separation of the outer wall or crust of the hoof from the inner layer of soft horn derived from the laminæ. Fig. 127. It is caused by an irregular and unhealthy secretion of the lower portion of the laminæ, which is incapable of maintaining the union between the above-named structures. The disease always commences in the lower portion of the laminæ, and extends upward and laterally.



Fig. 127.
Seedy Toe.



Fig. 128.
Hoof cut for cure of seedy toe.

Though known as seedy toe, the disease frequently affects the quarters, and, more rarely, other parts of the circumference of the foot.

Etiology.—Seedy toe is often a result of laminitis. At other times it may be caused by the pressure of the clip of the shoe. In some cases it is due to constitutional causes. After the separation has taken place, the disease is easily aggravated by dirt or gravel getting into the hollow so formed. Lameness is not usually present until the disease has run to a very considerable extent upward. When any considerable degree of separation has taken place, a hollow sound will be emitted on percussion.

Treatment.—All that portion of the crust which has become detached from the laminæ must be cut away with the knife; and if the disease

shows signs of extending, such further portions as may be necessary must be cut away, until the line of union between the crust and inner layer is smooth and undivided. Fig. 128. A bar shoe, without a toe clip, should be applied, with a view to relieve the anterior portion of the foot. Rub an ointment of:

Cantharides ..... ℥ ss.
Lard..... ..... ℥ vi.

into the coronet every second or third day, and every day cover the newly exposed surface with an ointment of:

Lard,
Turpentine..... .....āā ℥ viij.
Beeswax..... .....℥ ij.
Melt the lard and wax, and stir in the turpentine.

This will protect it from moisture. Keep the foot dry. It may take two or three months for the hoof to become perfect. During this time feed the horse liberally.

THRUSH.

Synonym.—Frush.

Definition.—Thrush is a disease of the frog, generally of the hind feet, accompanied by a foul discharge through its horny covering. As the disease advances, fissures occur in the side of the frog close to the heel, from which a fœtid matter exudes.

Etiology.—It is commonly due to dirt of some kind; wet unclean stalls, obliging the horse to stand in his own manure, are the most frequent causes of this disease, which is, therefore, a disgrace to the horse owner. It may also be caused by the filthy and wholly inexcusable practice of stopping the feet with cow dung or other filthy substances. Sometimes, in feet which have been for some time affected with navicular disease, a similar effect is produced on the frog; because the horse, on account of the disease, the seat of which is immediately above the frog, saves as much as possible that portion of his feet, and treads on his toes. It is, however, a signular fact that this effect on the frog is not often found in the

earlier stage of navicular disease. Again, in contracted feet, the sole is generally so much recessed that the frog hardly ever comes to the ground, and hence, from want of use, it becomes diseased.

Paring of the frog, independent of its injurious effect in removing the frog from pressure, has also a further tendency to produce disease.

Symptoms.—Foul smell and slight lameness.

Treatment.—In the treatment of those cases which originate in dirt and wet, first remove the cause and keep the frog scrupulously clean and dry. Any ragged or partially detached parts should be removed with a knife so as to open the cracks in and around the frog.

Having removed the cause, endeavor to absorb the discharge. This is essential, because the discharge is of an acrid nature, and has in itself a tendency to cause disintegration of the structure. The absorption of the discharge will be best effected by inserting pledgets of tow, greased with an ointment of calomel:

Chloride of mercury..... ℥ i.
Lard..... ℥ i.

in the cleft. The process of drying may also be assisted by the application of:

Sulphate of zinc... ..... ℥ iv.
Water.....1 pint

or powdered burnt alum. The crust at the heels should be bound so as to bring constant pressure upon the frog. Keep the foot dry.

When the disease has its origin in navicular disease, grease, or some habit of body, little more can be done than to keep the frog scrupulously clean, and to dry up the discharge with the astringents, etc., just described, as soon as it appears.

If thrush is long neglected, the neighhoring parts become affected, and in bad cases the whole of the sensitive sole is involved. The sole is then said to be "under-run;" or, in other words, the unhealthy secretion, being greatly increased and unable to find sufficient exit through the insensitive frog, burrows between the sensitive and insensitive sole. The disease, if still further neglected, may run into canker. The treatment of serious cases of neglected or chronic thrush is nearly similar to that required in canker.

CANKER.

Definition.—Canker is a morbid secretion of the sensitive frog and sole, involving, of course, the corresponding insensitive parts.

Etiology.—This formidable disease usually has its origin in neglected thrush, but it may be due to constitutional causes. It is not common in this country.

Symptoms.—Williams says: The characteristic symptoms of the disease are strongly marked, and consist of an abundant fœtid, colorless discharge from the frog, which is large, spongy, and covered by pallid, stringy prominences of a fungoid nature, intermixed with offensive smelling, semi-dried, cheesy masses of matter, composed of imperfect horn cells.

It seems as if the various constituents of the horn were in an uncombined state; the sulphur, which is a natural constituent, being secreted as sulphuretted hydrogen, giving the characteristic fœtor to the whole secreted mass; horny matter imperfect, and floating in an abundant liquid material; the secreting villi enlarged, scantily covered by a thin pellicle of horn, giving them superficially a white appearance, whilst underneath they are turgid, congested, and humid.

Treatment.—The treatment of canker consists in the complete exposure of the diseased surface, in the application of pressure, and in thorough dryness.

The whole, not merely the diseased portion, but the whole of the insensitive sole, must be removed. When this has been thoroughly and effectively done, the whole of the exposed surface must be dressed with nitric acid. The sole must then be firmly packed with dry tow, secured with a bandage, and the foot inclosed in a leathern boot. This will give the necessary pressure. To prevent excessive bleeding, from the removal of the sole, a tourniquet should be applied to the fetlock. The foot, bedding, and stall must be kept scrupulously dry.

After two days the dressing should be removed. In favorable cases, the whole of the exposed surface of the foot will present a healthy appearance, and will gradually become covered with good horn, and no further treatment will be required beyond cleanliness, dryness, mild astringents, and moderately firm pressure and bandages. For at least a week after the operation, the horse should stand without shoes. But as soon as the

feet are able to bear shoes, they should be applied, as it is much easier to dress the feet with shoes on.

But the more aggravated cases will continue to present fungoid elevations and morbid secretions, and will require repeated dressings with powerful caustics. The dressing should be changed every day, as after a few applications the same remedy seems to lose it effect. Chromic, sulphuric, and other acids may be used in turn. The following are also recommended:

Caustic chloride of mercury	℥ ss.
Hydrochloric acid	♏x.
Alcohol	℥ iv.

Or,

Tar	℥ iv.
Nitric acid	sufficient.

Pour the acid on the tar and stir rapidly until well mixed and effervescence is complete.

Or, sulphuric acid may be substituted for the nitric acid.

Care, however, must be taken not to continue the use of strong caustics too long, or the whole sensitive sole will be destroyed and necrosis of the bones induced, followed by great sloughing, and perhaps the death of the patient. After a time, therefore, instead of the above, burnt alum, sulphate of copper, terchloride of iron, chloride of zinc, sulphate of iron, logwood, and other astringents, may be tried. Carbolic acid may also be used. Most cases improve under firm pressure, but in others long-continued pressure seems to stimulate the diseased action and the growth of fungus. It is scarcely possible to lay down a positive rule. The symptoms of each case must be carefully watched and treatment applied accordingly. In all cases, except for the first two days, the dressing should be removed daily.

The general health must be carefully attended to. A purgative:

Aloes	ʒ vi.
Ginger	ʒ ij.
Linseed meal,	
Molasses	āā sufficient

or a diuretic:

Nitrate of potassium..... 3 ij.
In water twice daily.

will probably be beneficial in the first instance, followed after a time by tonics, as sulphate of iron or quinine. Good dry food, fresh air, great cleanliness, and a dry stable and bedding are essential.

NAVICULAR DISEASE.

Synonym.—Navicular arthritis.

Definition.—Navicular disease, in its primary stage, is inflammation of the lower side of the navicular bone. After a time the neighboring parts, viz., the perforans tendon which passes under the bone, and its cartilage and bursa become involved.

Etiology.—Navicular disease is commonly due to the effect of concussion; more rarely to nails, stones, etc., picked up by the foot.

It will be remembered that the navicular bone acts as a roller for the passage of the perforans tendon, which passes under it and is attached to the coffin bone. Hence the navicular bone is peculiarly liable to suffer from the effect of concussion.

Navicular disease occurs most frequently in feet with narrow and high heel. It rarely affects the hind feet.

The primary disease is inflammation of the navicular bone. The parts subsequently involved are the cartilage covering its inferior surface, the synovial membrane, the bursa of the tendon (flexor pedis perforans) passing under the bone, and ultimately the tendon itself. This tendon passes under the bone, as a rope under a pulley.

The inflammation which has been set up in the bone, leads to a variety of changes, both in its external and internal structure. In some cases the bone gradually wastes away until at last it becomes liable to fracture from any trivial cause. In other cases, an ossific deposit takes place upon the outside of the bone. This deposit limits the free play of the tendon, which gradually adheres to the bone, and its bursa becomes absorbed. In other cases, the fibres of the tendon split up, sometimes from friction against the roughened surface of the diseased bone, but more frequently as the result of degeneration caused by inflammatory

action which has extended to it from the bone. Ultimately the tendon may give way altogether.

Symptoms.—Lameness may appear suddenly, and without any apparent cause. It may disappear and after a time reappear, either in the same or in the other foot, and thus go on for some time. This occurs as a rule when the disease is due to rheumatism. In time the symptoms become more marked, and, in most cases, the first is pointing of the foot in the stable, also when at rest outside, followed by shortness in the step and lameness. The foot and the horse may be examined, and nothing wrong be found. Probably the next day the animal may be apparently sound. But in the course of a few days the symptoms reappear and usually are more marked than at first.

Pointing in the stable is common with many horses as an act of rest, or as a mere matter of habit. When, however, pointing arises either from habit, or as an act of rest, the animal stands squarely upon one fore-foot and allows the other to take a semi-flexed position in a careless, lounging way; but he points *two* feet simultaneously; namely, one fore and the other hind foot of the opposite side. In navicular disease, however, a fore-foot or feet *only* are pointed; there is no corresponding resting of the hind limb.

The above signs may leads us to *suspect* navicular disease as the cause of lameness. But the strongest indication of the disease lies in the absence of any observable cause, such as external injury or heat, sufficient otherwise to account for the lameness. The fact of intermittent lameness in the earlier stage, and of persistent lameness in the latter stage, without any external symptoms sufficient to account for it, are the strongest indications that the disease is in the navicular bone.

The symptoms of lameness are evidently those of foot lameness. If laminitis be present, there will be heat and tenderness, and the animal will travel more or less on its heels. If a corn be the cause, its presence is easily detected. In fact, in nearly every other form of disease, there are external signs which will at once point to its cause. But in navicular disease, if we except occasional heat and tenderness in the hollow of the heel, or redness of the frog and sole immediately below the navicular bursa, there is no external sign. Even the redness of the frog and sole, now and then met with, is not always to be depended upon as a sign of navicular disease, as it may arise from external injury, such as treading on a stone, and may be superficial only.

DESCRIPTION OF PLATE IV.

LAMINITIS OR FEVER IN THE FEET. (PERCIVAL.)

A longitudinal section has, in this Plate, been made of the near fore foot from the fetlock downwards.

It will be observed that the coffin-bone (*a*), which, had it been in its normal or natural position, would have lain slanting parallel to, as well as in close apposition with, the wall of the hoof (*b*, *c*), has its toe (*d*), instead of being advanced to *c*, descending and resting upon the middle of the sole, which, from the pressure of it, has bulged (at *d*), or, as farriers say, become *pumice*.

The dislocation or tilting of the coffin-bone upon the sole, necessarily causes a space within the foot between it and the wall of the hoof (*e*, *f*). This, we find, becomes filled up with a sort of *callus*, which in the course of time undergoes a gradual transformation into horny substance: as is intended to be shown by the yellow tint the drawing exhibits in the middle portions of the callus.

g, Section of the pastern bone.

h, Section of the coronet bone.

k, Section of the posterior parts of the foot.

i i i, Sections of the tendons.

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Dissection showing the seat and internal appearan
of Laminitis.

pressure. The seton should be dressed daily and allowed to remain for about three weeks or a month. The foot must be kept clean. After the seton is removed, the frog must be examined. It will usually be found to be under-run between the two orifices by purulent matter. The detached horn must be removed and the exposed part dressed with tar.

If structural changes have not taken place, this plan of treatment will usually be found effective; but if the lameness continues after a month has elapsed from the date of the removal of the seton, further treatment will be useless. The animal may be fit for easy work. As a rule, the disease will increase and in time render the horse useless.

The pain, however, though not the disease, may be removed by neurotomy. Under the influence of this operation the animal may go without lameness for some time. But it must be remembered that the disease is not removed by the operation. The usual result is that the hoof decays and falls off.

Neurotomy, or the division of the nerve leading to the back part of the foot, is useful in destroying the pain which arises from navicular disease. The operation is very simple, but should only be performed by one who has a thorough knowledge of the parts and of surgical operations.

It may be applied when the foot or feet are good and strong, and where the action is not extravagant. It will prove injurious where the feet are thin or weak at the heels, or where the soles are full or the action is high. In such cases, fever in the feet will probably ensue, as the horse, being relieved of all sensibility in his feet, will indulge in freer action than is good for the health of a weak structure.

In favorable cases, the horse may go without lameness for some time, but in the end the increase of the disease will cause a complete breakdown of the foot.

Horses which have been unnerved are obviously unsafe off a level road for some time.

LAMINITIS.

(SEE PLATE IV.)

Synonyms.—Founder; Fever in the feet; Inflammation of the feet.

Definition.—Laminitis is in its simple form inflammation of the sensitive laminæ which cover the outer and upper surface of the pedal bone.

They consist of five or six hundred very fine folds, and are profusely supplied with blood-vessels and nerves. The original attack is always acute. It may be entirely relieved and no ill-effects remain. But often a change of structure results from the effects of the acute attack. This after-result is known as chronic laminitis. Horses suffering from it are subject to recurrence of the acute disease. Laminitis is very painful, and the lameness is excessive. The pain is due to confinement of the products effused by the inflammation within the outer hard, unyielding case of the foot, and the pressure thereby caused on the sensitive structures of the interior. The seat of the disease is in the *anterior* portion of the foot.

Etiology.—The immediate cause, most frequently, is concussion. The fore-feet are more often affected than the hind, because concussion is most severely felt in them. Excitement, over-exertion, and indigestion are also frequent causes. The disease, however, in many cases is due to metastasis, or the sudden shifting of inflammation existing in some other organ of the body, to the feet. Long and fast driving on hard roads, especially after a period of comparative idleness, conduces to the disease.

Both feet, either hind or fore, are usually affected. Similar causes generally affect both feet, and therefore produce similar results. Sometimes all four feet are affected. When one foot only is affected, the cause is generally some injury of the opposite foot, which has led the horse to throw all the weight on the previously sound foot.

Symptoms.—The symptoms of laminitis are very marked. The attack occurs very suddenly. The horse can hardly be got to move. He seems as if all his body were cramped.

There is heat in the feet affected. As the seat of the disease is in the anterior portion of the feet, the animal will save that portion of his feet as much as possible, and will throw his weight on his heels. The disease is intensely painful. On account of the pain the pulse is always accelerated.

If the two fore-feet only are affected, the hind legs will be drawn under the belly, and the fore-feet advanced so as to take the weight off them as much as possible. If the two hind feet only are affected, he will stand with his fore-feet back under his body and his hind feet brought forward, so as to throw the weight upon the heels. If all four feet are affected, the symptoms will be a combination of the above. Dick says, to diagnosticate a case quickly, the best method is to push

the animal backward, when it will be seen at once that he will elevate his toes and throw his weight upon the heels. The pulse of laminitis is full, strong, and accelerated.

Treatment.—First endeavor to relieve the local inflammatian existing within the feet. *Mild* purgatives should be given, and if the bowels are torpid, injections of warm water should be administered. But powerful medicines will do serious mischief, on account of the irritability of the system in this disease.

On no account give strong cathartics, especially aloes, as we should avoid irritating the mucous membrane of the intestines. Give a pint of linseed oil, and assist the effect with an injection or two of warm water (100° F.). If there is purgation already, or if the fæces are covered with mucus—a condition which indicates irritation—give no aperient. In the case of diarrhœa, do not give astringents, as the purging is but an effort of nature to remove the cause of irritation. Remove the shoes and rasp the wall level with the sole, so as to allow the latter structure and the frog to bear the weight. On no account pare the sole. Give the horse plenty of water to drink, and put him on laxative food. If the pain be very excessive, give two ounces of tincture of opium, but do not do so if its use can be dispensed with, because it is best to keep up a loose condition of the bowels. In any case give two ounces of the bicarbonate of sodium twice a day in the food, and if the fever be high, with a quick, full, and hard pulse, give the following drench :

Fleming's tincture of aconite.....gtt. vij.
Water .....1 pint.

This may be repeated once or twice, with intervals of three or four hours, as indicated by the pulse. The soda has a most soothing effect on the mucous membrane, while the aconite is a sedative to the heart. If there be great heat in the feet and throbbing of the plantar arteries, bleed from the coronary plexus at three or four points; this may easily be done by puncturing the coronet obliquely with a lancet or penknife. Do not bleed from the toe, for doing so will expose the inflamed parts to the action of the air, and suppuration with the formation of matter (pus) may be the result. By bleeding from the coronary plexus, a local effect is obtained without weakening the whole system, as would be the case were the jugular vein opened. Keep the feet for a considerable time in

a tub of warm water, and apply poultices for a few days. Allow the horse to lie down as much as possible; if he will not do so of his own accord, throw him gently. The advisability of this is shown by the pulse, after the horse is down, always falling in a most marked manner.

The diet, if possible, should be grass; or, if grass cannot be obtained, bran mashes. An extra substantial bed of old litter is essential. Nature must do the rest.

In favorable cases, that is, where the inflammation is not very severe, and its effused products are taken up by the aborbents, there will be no structural alteration, and in due course the horse will be sound again, though always more or less liable to recurrence of the disease.

But in unfavorable cases, there will be an alteration of structure, and the result will be chronic laminitis.

The alteration of structure caused by the inflammation usually consists of a separation between the sensitive and insensitive laminæ and is termed chronic laminitis. In consequence of this loosening of attachment, the anterior point of the coffin bone descends and presses on the sole. The sole being pressed upon, also descends and loses its concave shape, and becomes convex and weak. The anterior portion of the crust, having in some measure lost its attachment, becomes weak and bulges out anteriorly. There is a large mass of imperfectly formed horn at the toe.

Treatment.—The frog and sole should remain untouched by the knife, and the crust filed down so as to produce a flat foot, bringing the pressure on the sole as well as the crust. Pressure on the frog is also most essential.

A little cantharides ointment:

Cantharides	℥ ss.
Lard	℥ vi.

may be rubbed into the coronet every four or five days, to stimulate increased growth of horn.

Let the animal stand on something soft in his stall—spent tan, straw, etc.

SIDEBONES.

Synonym.—Ossified cartilages.

Definition.—This disease, otherwise known as *Sidebones*, consists in ossification of the elastic lateral cartilages or wings of the bone of the foot, Fig. 129. Nature has substituted cartilage for bone in this part in order to give greater elasticity towards the heels. Any alteration in this structure, such as its conversion into bone, must interfere with the elasticity of the tread, though it may not occasion positive lameness. The



FIG. 129.
Ossification of the Lateral Cartilages—Sidebones.

bony deposit may, however, be so extensive as to materially alter the shape of the coffin bone; and in such cases lameness will be the inevitable result.

Heavy coarse cart horses are most subject to this disease, and in them the deposit is often very large. In light horses it seldom becomes so large as to be visible to the eye. The change in structure, however, is easily ascertained by feeling the wings of the bone of the foot. If they are affected with ossification, they will be hard and immovable instead of elastic.

Etiology.—Sidebones are generally supposed to be the result of inflammation set up in the lateral cartilages by excessive concussion or by an accidental blow, wound, or tread. The tendency of cartilaginous structures under the influence of inflammation to become absorbed and replaced by bone has been already noticed.

It is probable, however, that they also frequently arise from the practice

of shoeing heavy draft horses with large calks, which prevent the heels from coming to the ground and thereby deprive them of their natural elastic motion at each tread. When a part intended by nature for motion is long deprived of that action, we frequently find that it becomes solidified. This result is often found in joints, when long deprived of motion.

Others, however, whilst agreeing that high calkings are a frequent predisposing cause, think that they produce their injurious effect by causing undue pressure and concussion on the back of the foot and hence excite inflammation in the part.

Sidebones, in common with exostoses in other parts, sometimes have their origin in hereditary predisposition.

Symptoms.—A hard swelling at the back of the coronet and heels. Mayhew gives the accompanying illustration of his method of testing for sidebones, Fig. 130. "When the hand thus grasps and forcibly presses



Fig. 130.

Mayhew's test for Sidebones.

the part, instead of feeling the substances under them yield, the hand is sensible of something hard as stone, or approaching it. This being proof positive the cartilages are ossified, or becoming so."

There is no cure. If the cartilages are still undergoing change, blister the coronet with ointment of cantharides:

Cantharides in powder..... ℥ ss.
Lard..... ℥ iij.

Digest in a water bath (a tin kettle, which will set inside of a larger one partly filled with water, will answer) for two or more hours, and filter while hot through blotting paper. Use when cold.

This will hasten the inflammatory process, and as soon as the change in the structure of the cartilage is complete, the lameness will cease. The elasticity of the step will be lost, and the gait become stiff and unnatural.

Let the animal rest as much as possible until the inflammation has entirely subsided.

TREAD.

Synonym.—Calking.

Definition.—Tread is an injury of the coronet of the foot.

Etiology.—Most common with heavy work horses, and usually occurs in the hind feet, and during cold weather, when the horses are shod with sharp heel calks. Generally inflicted by the shoe of the other foot in turning, backing, or shying, and, very rarely, by a tramp from another horse.

Treatment.—If the bleeding is excessive, it may be stopped by bandaging with a rag soaked in:

Tincture of chloride of iron	℥ i.
Water	℥ i.

Afterward wash clean and treat as for over-reach.

OVER-REACH.

Etiology.—Over-reach is a wound of the heel of the fore-foot, usually made by a blow struck by the *inner edges* of the toe of the hind shoe.

Treatment.—Remove any jagged ends with a sharp knife, and apply tincture of myrrh or tincture of arnica; keep dry, and generally the wound will soon heel. If, however, the heel is badly bruised, after paring the lower ends, bathe it three times a day with:

Chloride of zinc	gr. i.
Water	℥ i.

As quittor is a possible sequence of an over-reach, it should never be neglected.

CHAPTER XI.

GENERAL, CONTAGIOUS, AND ENZOOTIC DISEASES.

Influenza, Pink Eye, Catarrhal Fever, Epizootic Catarrh, Horse Distemper, Horse Sickness, Febris Pyogenica, Colt Distemper, Colt Ill, Strangles, Glanders, Farcy, Equina, Erysipelas, Purpura Hemorrhagica, Spotted Fever, Scarlatina, Scarlet Fever. Rheumatism, Dropsy, Ascites, Œdema, Hydrothorax.

INFLUENZA.

Synonyms.—Pink eye; Catarrhal fever; Epizootic catarrh; Horse distemper; Horse sickness.

Definition.—Influenza is an epizootic febrile disease, accompanied by loss of appetite, great prostration of strength, and often complicated with disease of the liver, lungs, and mucous membranes generally, and sometimes with affections of the heart. In all cases the nervous system is affected to a great extent, and indeed, most of the more prominent symptoms may be regarded mainly as results of depression of the nervous centres. The cause of this depression is the presence of a specific poison in the blood. The respiratory organs are always involved. Influenza generally prevails as an epizootic, and is considered by some to be contagious.

Etiology.—Influenza has its origin in some peculiar and unknown condition of the atmosphere, which exercises a specific injurious influence on the health of animals.

Other causes, such as bad ventilation, dirty stables, an insufficient supply of nutritious food, bad forage, or debility, predispose to the disease. Animals crowded together in damp, ill-ventilated, and otherwise unhealthy situations, are generally the first to suffer from influenza. In them it commits its greatest havoc. Young horses are more predisposed

than those of maturer years; still, the old suffer severely and are often carried away. Sex has no influence. Neglect, of every description, as well as bad food and overwork, by debilitating, render animals subject to severe and early attacks of disease. But no amount of care will exempt them from it, as it appears in the stables of the rich as well as of the poor. The latter, however, experience it in its greatest intensity and at a much earlier period than the former.

Symptoms.—Influenza, in different years and in different places, varies much in its intensity and in some of its symptoms. In some seasons it assumes more of an inflammatory character, whilst in others it takes a low form. The description of symptoms given below will have reference to the *general* type of the disease rather than to the peculiar features which may be abnormally present in any particular outbreak.

In mild cases, for the first two or three days the horse is observed to be dull, weak, and dispirited; generally sweats on exertion; the bowels are slightly constipated; the fæces are paler than usual, and there may be occasionally cough. If the patient is promptly removed to a loose box and carefully treated, these symptoms may pass off (probably in the form of catarrh and a disposition to swelling of the legs) without the necessity for recourse to any active treatment.

More often, however, they are followed by others of a more urgent nature. The horse refuses his food, or grinds it; his coat looks unhealthy, the urine becomes scanty, the fæces pale and scanty, the surface of the dung pellets is glazed and perhaps partially coated with muco-lymph; the mouth becomes hot and unnaturally dry, or it may be pasty, particularly at the back of the tongue; and the mucous membrane altogether, and especially round the gums, is of yellowish-red hue, as is also the conjunctival membrane of the eyelids. The pulse is quick and oppressed, perhaps 70 per minute, but at the same time feeble, and the breathing is quick. The temperature rises to 103 to 105° Fahrenheit. The horse appears to be suffering from intense headache, and if made to move he staggers in his walk. These symptoms point very clearly to the nervous centres being functionally deranged, especially the brain.

These symptoms may remain much the same for two or three days, except that the pulse may become a little quicker, 80 to 90, and more feeble, and the respiration quicker and shorter.

If the horse is well nursed, and proper attention is paid to the ventilation, he will most likely recover without the assistance of medicine.

At other times the disease is ushered in and accompanied by weeping of the eyes, swelling of the eyelids and of the legs, and under the belly, and all other usual signs of extreme debility. Even in the very early stage the patient may be so prostrated as to require the assistance fo several men to remove him to a loose box. In these cases the strength requires to be supported at once by the administration of stimulants, such as:

Carbonate of ammonia,
Gentian .....āā ʒ ij.
Linseed meal,
Molasses .....āā sufficient

Make 8 balls. Give one every 12 hours.

With care and good nursing the threatened attack may pass off in a few days.

The discharge of purulent matter from the nose, in the early stage, is a good sign, and indicates that the disease is becoming milder. Favorable progress is also marked by the urine being discharged more frequently, and in greater quantities, and not so high colored; and by the dung becoming of a proper consistence, and soft instead of being voided in hard pellets. A slight tendency to œdema in this stage is also a favorable sign. It is one of nature's means of giving relief, and often prevents the occurrence of mischief in important internal organs. But in the later stages it is a symptom of the inability of nature any longer to continue the conflict with the disease.

Should the disease, whether it has commenced in the one way or the other, not take a favorable turn, the mucous membranes will become seriously involved, indicated by the heightened color. The discharge from the nose, instead of being purulent, will be suppressed and scanty, or it may be serous and straw-colored. The throat will become sore, as indicated by a difficulty in swallowing even water. The breathing becomes quickened, and the patient may cough somewhat frequently. The suppressed character of the cough points to the mucous membrane of the bronchiæ being involved.

In other cases an unfavorable turn is indicated by the occurrence of fits of shivering, by the breathing being somewhat embarrassed, by the pulse being increased in frequency and very small in volume. The fits of shivering may or may not recur. Profuse perspiration sometimes supervenes on the rigors, and always temporarily relieves the breathing.

The treatment up to this point consists in diffusible stimulants and plenty of cool fresh air. If the patient's constitution is good, a favorable change may be expected.

If the attack at this juncture does not take a favorable turn, the symptoms will probably become more intense. The membrane of the nose may become mulberry red, and in very bad cases the discharge may be tinged with streaks of blood. In some cases there may be a discharge of muco-pus from the eyes. The legs often swell, especially the hind ones, and there may probably be swellings in the sheath and under the belly. A tendency to œdema often exists about the larynx and glottis, and serum may be effused into the air cells and structure of the lungs, or along the spinal cord, or in the cavities of the brain. The animal may wander unconsciously around the box, and look at his sides and paw occasionally as though in pain. At this critical stage great care and caution are needed in the management of the case. Stimulants may be employed, but powerful sedatives are very injurious. The nervous centres are already paralyzed, and digitalis, belladonna, and such like agents will only increase the mischief. The feeble flickering flame of life must be roused, not extinguished by sedatives. Even spontaneous diarrhœa is to be dreaded, and far more the excessive purgation which is likely to result from a dose of aloes given to the animal so debilitated.

At this stage the disease often assumes an intermittent form, and the animal alternately gains strength for a time and relapses. Even if the animal survives, chronic cough, defective respiration, skin disease, rheumatism, or paralysis are often after-results of such extreme development of influenza.

When a case is about to terminate fatally, the pulse will be found to falter and sink, and as final cold sweats will break out. Death generally occurs about the sixth day, but the case may be protracted to about the fourteenth day.

Throughout the attack it must not be forgotten that the inaction of the bowels is often mainly dependent on want of sufficient nervous tone and energy. There is often no undue hardness of the fæces, but rather the contrary. The proper action of the bowels will best be restored by the administration of stimulants and tonics. In some cases injections of tepid water and linseed oil are useful.

There is sometimes a strong disposition to gangrene in wounds in horses suffering from influenza of a low type. Ulcerous sores or simple wounds

take on an unhealthy action from no apparent cause, and this action extends to neighboring parts, and sloughs may result. Great caution should therefore be used in applying strong blisters or setons in influenza, even if for other reasons they were not objectionable.

When an animal is recovering from a severe attack of influenza we must not expect any great and rapid improvement. The change will be gradual. We must wait patiently, and be satisfied to look on and seek to aid nature in the gradual restoration of the system. After a bad case there will be, during convalescence, frequent changes, slight accessions of fever, inequality of heat and cold on the surface of the body and legs, and slight shiverings. The appetite will only slowly return, and will be irregular in character. It is always a good sign to see the horse lying down, and comfortable in that position, especially if the breathing is not accelerated by it.

The treatment during convalescence is simply good nursing and carefully regulated administration of tonics.

In most cases the liver is functionolly deranged, more or less affected, and there is a peculiar straw-colored discharge from the nostrils.

Treatment.—The great aim must be to support the animal through the disease, and enable nature to get rid of the morbid material in the system.

Good nursing is the primary requisite. Keep the body warm, with blankets if necessary. Let the food consist of warm bran mashes, or boiled oats, and mix one-half ounce of nitrate of potassium in the food once a day, and give plenty of water to drink. It is a good plan to keep water where the horse can get at it at all times. In mild cases no active treatment will be needed and the animal will begin to recover in from four to six days.

The medical treatment consists mainly in avoiding drastic purgatives and strong sedatives. Saline agents, however, such as sulphate of magnesia (Epsom salts) in doses of from one and a half to two ounces for several days, or Robertson recommends:

Nitrate of potassium	℥ ij.
Powdered camphor,	
Ext. belladonna	āā ʒ ss.
Sweet spirits of nitre	♏ i. to ♏ ij.
Acetate of ammonia	♏ iv.

Twice a day.

This will act beneficially in lowering the fever and changing the condition of the blood which in influenza always becomes dark-colored as the disease proceeds.

When, however, the fever is accompanied with much prostration, it will be advisable to give sweet spirits of nitre in doses of from one to two ounces, at intervals of about four hours. If the prostration increases, a draught of

Carbonate of ammonia ..... ℥ ij.
Camphor,
Ginger..... .....āā ℥ i.

In those forms where the abdominal complications are prominent features, the horse inclined to be restless and occasionally lying down and rising again, as if suffering from colic, with a confined condition of the bowels, it will be needful to give our attention to relieve this restlessness and pain; enemata of tepid water or tepid water and oil, with the application to the abdomen of woollen cloths wrung from pretty warm water, are often sufficient to attain the end desired.

Where the pain is more persistent, or where the confined state of the bowels is accompanied with a distinct yellow condition of the visible mucous membranes, it will most probably be needful to exhibit a moderate dose of linseed oil, to which has been added one or two ounces of tincture of opium, or from ten to fifteen drops of Fleming's tincture of aconite, while the hot-water applications to the abdomen may be supplemented with smart friction with soap or ammonia liniment; while where pain is the prominent feature, and not accompanied by marked constipation, it is readily enough relieved by subcutaneous injection of:

Magendie's solution of morphia.....℥xx. to ℥xl.

When both pain and constipation have continued more or less troublesome for some days, with a foul condition of the mouth and tongue, the animal all the time continuing to partake occasionally of a little mash, an endeavor ought to be made to induce it to take along with the mash a certain quantity of linseed oil, or a rather full allowance of sulphate of soda. In such cases, the exhibition twice daily in bolus of half a drachm of opium and twenty grains of calomel, together with the oil, will prove efficacious in removing or relieving the pain and confined condition of the bowels.

If the throat is sore and swallowing difficult, smear a small portion of the following electuary on the tongue occasionally:

Powdered camphor..... ..... ℥ iv.
Powdered myrrh,
Nitrate of potassium.....āā ℥ viij.
Ext. belladonna..... ℥ ij.
Powdered licorice root..... ℥ viij.
Molasses ....sufficient.

And a counter-irritant to the throat may assist in relieving it:

Soap liniment.....½ pint
Strong liquid ammonia..... ℥ ij.
Mix;

if the lungs are affected, rub this liniment upon the chest also. The application must be mild, and only to the extent of exciting a smart irritation, not to the extent of blistering.

Steaming with the nose-bag will be useful and grateful to the patient, during the dry stage of the inflammation.

The warmth of the body and legs must be maintained by blankets and bandages.

As the disease abates, the medicines should be gradually withdrawn. The debility which supervenes will require most careful nursing, and if the appetite is irregular, tonics will be needed, as:

Bicarbonate of sodium,
Powdered gentian..... .....āā ℥ ss.
Powdered nux vomica.... .....gr. xx.
This is one dose; give morning and evening.

Or some may prefer:

Sulphate of iron..... ℥ ss.
Mixed in the food; to be given twice a day.

This will improve the quality of the blood. It should be discontinued as soon as the dung becomes dark-colored.

Horses recovering from influenza are sometimes attacked with a skin disease, which consists in the skin being wholly or partially covered with little flattened lumps. In chronic cases, the cuticle peels off and leaves as many bare spots as there were lumps; but more often the lumps disappear spontaneously in a short time.

Rheumatism is an occasional after-result, as are also roaring, whistling, and chronic cough.

STRANGLES.

Synonym.—Colt distemper.

Definition.—Strangles is a disease usually attended with an eruptive fever, generally appearing before the horse is five years old. The local symptoms usually manifest themselves in, or in connection with, one or other of the glandular structures. Most commonly the submaxillary and parotid glands become inflamed, and suppuration afterwards takes place in the connecting tissue and its neighborhood.

In favorable cases the tumor usually occurs in the submaxillary space, and terminates in an abscess in the cellular tissue and textures covering the glands.

Strangles, though a debilitating disease, in general leaves no injurious effects. On the contrary the patient usually thrives well afterwards, especially if the suppurative process has gone on favorably. If, however, the eruptive fever is checked by injudicious treatment, or the animal is too weak to throw out the eruption, he will not do well.

Etiology.—There are various theories as to the cause of this disease, but none which satisfactorily account for it. By some it is considered infectious, though this is hardly probable. Few horses escape it altogether, but rarely or never have it a second time.

Symptoms.—The horse is sick and off his feed, and perhaps has a slight catarrh with feverish symptoms. The coat becomes harsh and staring and the animal hide bound. In a day or two the glands under the jaw or behind the ear begin to swell. Partly from the effect of the fever which accompanies the attack, and partly from sympathy, the throat also becomes sore; and although evidently thirsty, there is much hesitation and difficulty in swallowing, with much slobbering and some acceleration of the breathing. Williams describes the symptoms as follows, viz.:

Strangles manifests itself in three ways.

1*st*. It commences with the common symptoms of a mild catarrhal affection. The animal is somewhat dull, has a slight cough, some soreness of throat, a disinclination to feed, and more or less inability to swallow. The submaxillary space swells, is hot and tender, the swelling filling up the whole space or confined to one side only; and is either diffused or circumscribed. There is generally some dribbling of saliva from the mouth, and a discharge from the nostrils. Fig. 131. In most instances the pulse is somewhat hurried, and the respiratory movements slightly increased.



FIG. 131.
Symptoms of strangles.

2*d*. For some weeks, or even months, prior to the local manifestation of the disease, the animal is unthrifty, loses flesh, becomes hide bound, drawn up at the flank; if at grass, stands apart from his fellows, has more or less cough, often stretches himself as if fatigued, shivers on the application of slight cold, his coat stares, his growth is arrested. The horseman says that "he is breeding strangles," and time confirms the correctness of this opinion, the local signs of the disease becoming developed, and very often to a more severe extent than in the first form.

3*d*. The premonitory signs are those which have given the name to the disease, namely, those simulating strangulation, with great difficulty of respiration, accompanied by a loud trumpet-like sound, emitted more especially during inspiration. This sound may arise from spasm of the muscles that close the glottis, namely, the crico-thyroideus, crico-arytenoideus lateralis, thyro-arytenoideus, etc.; or from an œdema-

tous condition of it (œdema glottidis). If from the first cause, the inspiratory sound only is heard; but if from the second, both movements may be accompanied by the roaring noise, the inspiratory to a greater extent than the expiratory.

When the tumor forms regularly in the submaxillary space, and is of the ordinary size, the abscess generally comes to maturity without much trouble or inconvenience.

If, however, it is situated high up towards the parotid glands, the distress in the breathing will often be very great, and the feverish symptoms will run high. The noisy breathing, which forms so marked a feature in most severe cases, and from which the disease obtains its name, is owing chiefly to the tumor pressing on the larynx, and partly also to the inflamed and swollen state of the lining membrane of the larynx, which becomes inflamed by sympathy. The tumor often becomes exceedingly large, and the patient may get excessively weak from being unable to masticate his food. In some cases the animal may be in danger of suffocation from obstruction of the breathing caused by the size and situation of the tumor.

Treatment.—As strangles runs a specific course, the great object in treatment is to assist nature to develop the eruption fully and quickly. Never do anything to check it or cause its absorption, it would be very apt to fly to another, and perhaps to some internal glandular structure. Nourishing food is a first requisite, and as his throat is sore, he can take nothing but soft food. Hence good nursing becomes the main point in the treatment.

The patient's appetite must be carefully watched and tempted with anything that he will eat. In bad cases, grass is not only the best, but is often the only food that the animal can be tempted to swallow or to attempt to swallow. Carrots finely cut lengthways are the best substitute when grass cannot be obtained. Bran mash is sometimes palatable for a day or two, but in general it soon becomes distasteful. Linseed gruel carefully and wisely prepared may also be offered. If the patient is able to eat, he should be supplied with oats softened by boiling water poured over it, with the addition of bran and linseed meal. Whatever food is offered him must be in a softened condition. Sometimes hay, cut and soaked in boiling water, is also palatable. The steam arising from it will also be found to be beneficial by soothing the inflamed surface.

Warm clothing must be applied to the body, and bandages to the legs. At intervals, if the legs get cold, the bandages should be removed, and the parts rubbed with the hands, until warmth is restored. The patient should be placed in a cool well-ventilated box with abundance of air both day and night. Cool fresh air in this, in common with all diseases in which the respiratory passages are affected, is of the utmost importance.

If the bowels are constipated and cannot be opened by laxative food, it is better to let them alone, rather than to give strong purgative medicine, both for fear of checking the eruption and also on account of its tendency



FIG. 132.

Bandage for tumor of strangles.

to reduce the strength and perhaps bring on superpurgation. In the early stage it is best to keep the enlarged gland warm with layers of dry flannel. Fig. 132. If the tumor appears sluggish and slow to come to a head, a blister will hasten the process, sometimes by several days. Use

Powdered cantharides..... ℥ i.
Fresh lard ..... ℥ vi.

Mix them together with gentle heat for three hours, stirring occasionally while hot, filter through paper, and allow the clear liquid to cool.

As soon as the tumor has headed, it should be freely opened with a lance, in preference to allowing a natural opening to form, because the opening may be made at the most favorable point, because incised wounds heal more rapidly than irregular openings and are also less liable to leave a blemish.

As soon as the abscess is opened, the matter will squirt out with great force. The incision must be kept open, and the abscess occasionally injected for a few days with warm water by means of a syringe in order to clean away any matter which may be adhering to its sides. Or a small piece of tow may be put into the opening and removed occasionally, to prevent the wound closing too soon.

But when the abscess is deep-seated, great caution is necessary in the operation for fear of injuring with the lancet any of the blood-vessels in its neighborhood. Any considerable flow of blood may prove fatal to an animal already in a weak and debilitated state; and again if the lancet should cut through the duct of the salivary gland, we may have a very troublesome fistulous sore, discharging saliva. The operetion should not be attempted unless the pressure of the tumor produces great distress in the breathing; or unless it is so situated that it is probable that the pus, which will escape on its bursting internally, will cause suffocation. Premature lancing of the tumor should be carefully avoided.

Occasionally it happens that the tumor is so placed on the side of the throat that by pressing on the windpipe it causes extreme difficulty in breathing. In such cases it may be necessary to open it, even though not fully matured; and if it can be laid well open with safety, the operation will give relief. In extreme cases relief to the breathing can only be obtained by tracheotomy. Though the glands about the head are the usual seat of the tumor, yet abscesses may, as mentioned above, form in any of the glandular structures.

If the tumor should form in any of the *internal* glandular structures, such as the mesentery, liver or lungs, it will probably be fatal.

The tumor of strangles may also form in different parts of the body apart from the glandular structures, as for instance on the shoulders, in front of the chest, etc.

The after-treatment consists simply in the continuance of good nursing and careful attention to appetite, diet, and ventilation, until the strength is restored.

RHEUMATISM.

Definition.—Rheumatism is an inflammation of the fibrous structures of the sheaths, joints, tendons, ligaments or muscles, or of the heart and closed cavities, of a peculiar shifting type. It may be chronic or it may be acute. The acute attack is usually accompanied by febrile symptoms.

Viewed in its more general aspect, as distinguished from the course of any particular attack, this disease may be said to be a result of a low or impaired state of vitality.

The chief peculiarities of the disease are the suddenness of its attacks and a very remarkable tendency to shift from one part to another.



FIG. 133.
Knee-joint in health.



FIG. 134.
Knee-joint after chronic rheumatism.

Structures which have been once affected are very liable to recurrence of the disease, and after a time it may become chronic in such parts. But though it may be chronic, variations in degree will be felt from time to time according to weather, health, and other changing circumstances.

Etiology.—Rheumatism is often caused by neglect. It is very readily brought on by exposure to wet and cold, by insufficient diet, by

bad stable management, by neglect, and by all other such causes as lower the general health. Rheumatism is also a frequent sequel of any debilitating disease, especially of chest affections and influenza, or from natural predisposition without apparent cause.

Symptoms.—The symptoms of rheumatic fever are as follows:—Sudden lameness, with or without swelling of some particular articulation, such as the stifle, hock, or fetlock joints, the flexor tendons, immediately below the knee or hock in the sesamoidean bursa, the thecæ of the muscles of the loins and quarters, or of those of the thoracic walls, constituting pleurodynia. The lameness may be preceded by some febrile disturbance or a malaise condition, expressed by yawning, dulness, or dejection. The lameness often disappears from one part of the body and suddenly reappears in another. Very often the lameness is symmetrical, that is to say, it will be due to inflammation of the same joints in both legs, say in two stifle or in two hock joints.

If the attack be severe, or if it be continued, the parts affected will soon become hot and swollen. When a part has been frequently attacked, a chronic swelling generally becomes apparent.

When rheumatism arises from exposure to cold or wet, it generally affects the loins or shoulders.

Treatment.—As soon as the diagnosis is made, give the following:

Salicylic acid,
Bicarbonate of soda.....āā ʒ i.
Give as a drink three or four times a day.

This treatment will usually give immediate relief, and with laxative food will cure in many cases.

Oil of wintergreen mixed with an equal quantity of olive-oil applied externally to inflamed joints affected by acute rheumatism, sometimes affords instant relief.

In severe or long-continued attacks, it is advisable to give:

Bicarbonate of potash,
Nitrate of potassium,
Powdered colchicum.....āā ʒ ss.

If the lameness is persistent after the ordinary means of reducing inflammation have been employed, blisters of:

Biniodide of mercury..... ℥ i.
Lard..... ℥ viij.

may be applied to the inflamed parts, and followed by linseed meal poultices over the blistered parts, to promote the flow of serum.

DROPSY.

Synonyms.—Ascites; Œdema; Hydrothorax.

Definition.—A watery effusion which collects under the skin of the belly, sheath, and sometimes the legs and chest; still more rarely in the testicles.

Etiology.—An effusion of serum, which produces soft, pitting swelling, may result from a diminished and retarded, or from a retarded though not diminished state of the circulation; or it may result from a poor impoverished condition of the blood; or all these causes or some of them may exist in combination, though ascites most frequently results from diseases of the liver, the heart, and from indigestion of improper food.

Dropsy may also occur from any cause, such as a sudden chill or exposure, which disturbs or arrests the two processes of exhalation and absorption, natural to all secreting surfaces in health.

Dropsical swellings, which are distinguished from the foregoing by the symptoms of heat, tenderness and pain, result from congestion of the blood-vessels under the influence of inflammatory action.

The abnormal disposition to effusion, as the result of congestion, generally arises from a weak or debilitated constitution, or from a circulation which has become deficient in tone and vigor. The attacks of inflammation which end in dropsical swellings are generally very acute. The swelling itself in such cases is formed very suddenly and rapidly.

Symptoms.—Enlargement of the belly and sheath, a dull sound on percussion, and the fluctuation of the contained fluid on pressure. As the fluid increases the breathing becomes thoracic, the bowels irregular, and the coat rough and unthrifty. If the disease has progressed as far as this, the case is usually hopeless.

Treatment.—If caused by improper food, a change to generous diet with occasional aperients as:

Linseed oil..... ...1 pint

Or,

Aloes..... 3 iv.
Ginger..... 3 ij.
Linseed meal,
Molasses.....āā sufficient

and tonics as:

Sulphate of iron..... 3 iv.
Gentian
Ginger.....āā 3 ij.
A ball daily.

will soon effect a change. Good grooming, with moderate exercise in the open air, will prove advantageous.

If the symptoms indicate arrest of secretion of the liver:

Calomel..... 3 ss
Powdered ginger,
Powdered gentian.....āā 3 ij.
Make one ball.

If it be an after result of disease of the lungs and pleuræ, the best remedies are those indicated in Chapter II. If the cause be traceable to disorder of the kidneys or liver, those organs must be treated as indicated in Chapters VI. and VII.

A slight diuretic as:

Powdered digitalis..... 3 i.
Sulphate of iron..... 3 ss.
Linseed meal,
Molasses.....āā sufficient

for one ball, may be given occasionally with benefit to horses predisposed to this complaint. If the animal is poor, a generous diet is essential.

In very urgent cases removal of the fluid may be effected by mechanical means, such as tapping with a trocar and canula, Fig. 135. The operation, however, is not in general of much avail, as the fluid usually forms again. In those cases in which the accumulation is considerable, and from its proximity to important organs is likely to produce a serious

result, such as positive obstruction to the respiration, it may be necessary to have recourse to tapping; but except under such circumstances the fluid should not be removed by mechanical means.

Removal of the fluid in less pressing cases may be best effected indirectly by rousing the action of the skin by means of stimulants; whilst



Fig. 135.
Trocar and canula.

at the same time the secretions of the bowels and kidneys may be increased by very mild doses of aperient or by more active doses of diuretic medicine, as:

Iodide of potassium..... .....3 ss.
Extract of gentian,
Powdered ginger..... ....āā 3 ij.
Make into ball and give night and morning.

It is said the following is very useful in reducing dropsical swellings, viz:—

Sweet spirits of nitre..... .....3 ij.
Oil of turpentine..... .....3 i.
Give as a drink in one quart of decoction of broom-corn seeds.

Friction and pressure to the part, when practicable, are very useful in restoring a healthier and more vigorous tone to the vessels. See also page 217.

GLANDERS AND FARCY.

Synonym.—Equina.

Definition.—A contagious, malignant and fatal disease, during the progress of which the mucous membrane of the nose, larynx, and trachea are specifically affected. Glanders and farcy are different manifestations of the same disease.

Etiology.—The primary cause of glanders is not clearly understood. Old age, hard, debilitating work, bad food, miasmatic surroundings, illy ventilated and badly drained stables, overcrowding in confined quarters seem to favor the development of the poison. The discharges from the nose of a glandered horse will infect others, and as the poison is communicable to men, great care must be taken in suspected cases to avoid it.

Symptoms.—Glanders, as most commonly met with, presents the following signs:—The horse is generally more or less off its feed, has a tendency to shiver on the slightest cold; its coat is rough and unhealthy, "has lost the bloom of health;" it may or may not cough; the appetite is capricious; and perspiration is induced by slight exertion. There is a discharge of a starchy or gluey material from one or both nostrils; the discharge is often tinged with blood. In some instances recurrent hemorrhage from the nostril is a premonitory sign of glanders. The mucous membranes are pale and unhealthy, and that covering the nasal chamber, from which the discharge issues, is studded over with deep, pit-like ulcers. The ulcers are characteristic, being excavated, as if cut with a punch, but after a time they become ragged at their edges, irregular, enlarged in all directions, and confluent. The spaces between the ulcers are covered with hard yellowish pimples, which soon ulcerate. The eye of the affected side is weak, and looks smaller than its fellow, and an unhealthy discharge often issues from it over the face. The submaxillary lymphatics of the same side enlarge and form a tumor—sometimes single, sometimes lobulated—which is more or less firmly adherent to the surrounding tissues.

Acute Glanders appears suddenly with rigors more or less marked, the temperature of the animal is sometimes as high as 106° to 109°, the breathing is accelerated, the pulse feeble, rapid, and even dicrotonous, the heart's action palpitating and accompanied by metallic tinkling, the appetite fails, the pituitary membrane, at first of a dark copper color, with patches of ecchymosis of a dark-red hue, becomes purple, and the patches are rapidly converted into pit-like ragged-edged ulcers, from which issues a copious sanious discharge. The submaxillary lymphatic glands enlarge. Other lymphatic glands inflame, enlarge, suppurate, burst, and expose raw, unhealthy-looking sores, from which issues a more or less ichorous and irritating purulent material. The eyes are weak, and a discharge issues from them; the nostrils are often swollen. The breathing is hurried, irregular, and impeded by the swelling of the nos-

trils, and by the glutinous discharge drying around them; abscesses speedily form along the course of the lymphatics of the face. The urine is pale, watery, and increased in quantity.

Acute glanders is rapidly fatal.

Chronic Glanders is the common form seen in the horse.

In some instances the disease presents itself in such a mild form that the general health is scarcely affected. There will be a discharge from one or both nostrils, generally from one nostril, and that very often the near (left) one. The submaxillary lymphatic glands are swollen and hard; the hardness and swelling are of a remitting nature, very often varying in size in a short period. For example, a horse may be left at night with scarcely any discoverable swelling, and found in the morning with a hard knot under the jaw, which is both easily seen and felt. The swelling may continue for several days, afterwards slowly disappear, and then reappear as rapidly as before. This condition may exist before any discharge issues from the nose, and a horse so affected is elegantly said to be "jugged." If the nostril of such a horse be examined, it will be found to be paler in color than natural, or perhaps tawny, coppery, and sometimes of a dull leaden hue. The discharge of glanders presents a starchy or glue-like appearance, adheres to the nostrils, where it dries and accumulates, causing the nasal opening of the affected side to appear smaller or more contracted than in health.

These appearances, in addition to a weak or de litated condition of the eye of the affected side, may be all the symptoms present in a case of chronic glanders; indeed in some instances there may be nothing but the discharge from the nostril to lead one to suspect anything wrong with the animal, and the diagnosis is consequently very difficult, more particularly if the case is a solitary one; but where glanders is found to exisl in a stable, any suspicious symptom becomes significant. I have said nothing about the glanders-ulcer, because in many instances of chronic glanders the ulcer is undiscoverable; indeed in some rare cases ulcers are never found either before or after death. For this reason Percivall limited the term chronic to that form in which no ulcers could be detected. He says, however, that they are always present in the frontal sinuses.

Acute Farcy, which together with chronic farcy has just been stated to be another manifestation of glanders, is initiated in very similar manner to acute glanders. A general swelling of the cutaneous tissues takes

place which may increase and subside alternately for a time, but suddenly a number of distinct swellings or nodules will appear, termed "farcy buds." Fig. 136.

These specific tubercles, so characteristic of farcy in either its acute or chronic form, are situated in the cutis, or the subcutaneous connective tissue; or they may penetrate deeper, affecting the muscles. Individually they vary in size from a pea to a hazel-nut.

In a few days central softening, and disintegration, with rupture of



FIG. 136.
Farcy buds.

skin, take place in these individually. The openings or sores thus formed, now known as farcy ulcers, are deep, angry looking, with rounded ragged edges; they are disposed to extend and discharge a foul, grayish-white creamy liquid tinged with blood. These buds, or nodules, are often developed in groups clustered over a limited space, and the ulcerative process proceeding with much rapidity from each centre, shortly converts two or more of the original chancres into one large, many-pitted, irregular-margined ulcer.

The discharge from these sores is very abundant; and, although mostly distributed over the adjacent surface, does in some cases, and to a limited extent, collect and harden in brownish crusts around the openings of the sores.

In addition to the existence of these buds, or ulcerating sores, we have also a characteristic prominent, projecting, or corded condition of the lymphatics. The inflammation of these vessels may take place coincident with the appearance of the nodes, and previous to their suppuration; or it may not be obvious until the open suppurating sore has been established. These vessels, when thus affected, seem and feel full and hard, as well as being painful to the touch—in these respects resembling the nodules and infiltrations. Not unfrequently the termination of acute

farcy is the development of glanders in an acute form, with all the characteristic lesions in the nasal chambers, glands, and air-passages.

Chronic farcy is not usually accompanied by the same degree of constitutional disturbances as the other forms of equina. Circumscribed swellings appear generally in those parts of the body where the skin is thinnest; the changes which occur in these tumors are the same as those described in acute farcy. The lymphatic glands are inflamed and swollen and form a corded network in the skin.

The physical appearances and characters of these 'cords,' or inflamed lymph-vessels, are not always precisely similar. Generally of the thickness of a goose-quill, they are rarely, either in their bulk or the uniform resistance or tension of the swelling, continuously alike. At irregular points along their course, usually at the situations of the so-called valves, there are dilatations or small circumscribed spots of induration and elevation of tissue, which have not inappropriately been likened to a string of beads or pearls. When these small indurated swellings are fairly developed they do not often disappear, but, like the primary farcy bud, gradually take on ulterior changes, terminating in central softening and discharge of puriform material. These smaller buds further comport themselves in a precisely similar manner to the larger ones, by widening through ulceration, and ultimately coalescing, thereby forming not merely an ulcerous sore, but an ulcerous sinuous tract or cavity; these unhealthy secreting sinuosities have generally been known as '*farcy-pipes.*'

Treatment.—No known methods of treatment avail to do more than prolong life. An animal in which either glanders or farcy is suspected should be at once isolated, and as soon as the disease is clearly manifested. it is best to be destroyed at once.

ERYSIPELAS.

Definition.—A specific febrile disease accompanied by inflammation of the skin and subjacent tissues, followed by swelling which usually spreads rapidly, by an eruption, and by pain.

Etiology.—Weak and exhausted animals are most subject to it. It generally succeeds wounds of the legs.

Symptoms.—The symptoms of erysipelas are thus stated by Robin-

son: In the *cellulo-cutaneous* variety, which is probably the most commonly met with in the horse—indeed there is some doubt whether in him the skin is ever, in a pure and uncomplicated form, the seat of this morbid action, but is not in every form complicated with the invasion more or less of the subjacent cellular tissue—the effusion into the subdermal connective structure is at first purely serous, and consequently the swelling resulting from this infiltration pits easily on pressure, the indentation being as rapidly filled up again when the pressure is removed. As the disease advances, however, the effusion is more strictly inflammatory, the pain is greater, the skin feels resisting, tension being increased; the material extravasated is less susceptible of indentation when pressed upon, and the parts acquire a firm, brawny feeling.

The presence of numerous well-defined vesicles, although a characteristic symptom of the disease, is nevertheless not met with in every case, and the serous exudation found preceding as well as accompanying them occurs at intervals over considerable areas of the skin. The tendency of the epidermis to become detached is well shown by pressing on the vesicles, when the contained fluid is readily distributed over a large surface; while the character of this fluid may be taken as a fair criterion of the severity or malignancy of the seizure: it is more truly serous in the milder forms, and bloody and albuminous in the less benignant.

When the inflammation in the subcutaneous tissue has terminated in the process of suppuration, or when patches of skin are losing their vitality, ultimately to be removed by sloughing, the hair falls off or is easily removed, and the skin appears of a leaden hue and of a moist feeling.

The recognition of erysipelas, although ordinarily not a difficult matter, may in particular instances be confounded with some of those disturbances in which hæmal contamination is a prominent feature, as scarlatina or purpura, with acute farcy, or with lymphangitis. With the exercise of a little care, however, it is easily enough differentiated from all of these. From scarlatina it is distinguished by its non-association with a previously diseased condition, and by, in the severer cases, the more sthenic character of the pyrexial and inflammatory symptoms. In erysipelas the tumefaction of the limb is uniform and firm, not in patches as in scarlatina; although both have oozing of serous fluid from the skin, the manner of oozing is different. In erysipelas pain on manipulation is more marked, while in scarlatina there are no circumscribed or diffused ruptures of the cutaneous tissue; infiltration and swelling of gland-tex-

tures are characteristic of scarlatina, not so of erysipelas. From purpura it differs by the more sthenic character of the entire morbid process, by the local tumefaction being uniform and confined to one particular part of the body, usually the limbs, and most frequently a hind limb; while in purpura the swellings are irregularly distributed, sharply defined, and the head is early and markedly affected by these. The swellings in purpura are also comparatively painless, not, as in ersipelas, acutely sensitive.

From the local swelling of acute farcy it differs in that here we have no corded lymphatics nor any of the peculiar growths, farcy buds or nodules; for although there may be sores in both cases, the character of these sores is dissimilar; they have no hard base and circumference of indurated tissue as in farcy, while the exquisitely sensitive condition of the entire dermal surface, so marked in erysipelas, is not so prominent in farcy.

With lymphangitis it has certain resemblances, particularly in the early stages of both affections; as the disease progresses, however, there is little danger of their being confounded, while all through their respective courses there are certain distinguishing features. In lymphangitis the swelling, heat, and tenderness appear first in the inguinal region, and after a time extend downwards; in erysipelas the same local conditions almost invariably originate in the vicinity of the hock, or between that joint and the fetlock, and extend in both directions. There is rarely any exudation from the skin in ordinary lymphangitis, and never any of the vesication, local gangrene and sloughing sores so characteristic of erysipelas; nor is there any liability to structural changes in the membrane of the mouth and upper air-passages.

Treatment.—Usually erysipelas runs its course in ten to fourteen days. Fomentations of warm water to the affected parts, and smear with an ointment of:

Extract of belladonna,
Lard ..... āā ʒ i.

The bowels should be opened by a cathartic of from six to eight drachms of powdered aloes with linseed meal and molasses to form one ball. After it has operated give tincture of chloride of iron in two to four drachm doses every four hours. If there is much constitutional disturbance, it

will be advisable to administer tincture of aconite, twenty drops in water every four or five hours.

PURPURA HÆMORRHAGICA.

Synonyms.—Spotted fever; Charbon.

Definition.—An eruptive non-contagious fever, characterized by the appearance of petechial or blood spots upon the mucous membranes.

Etiology.—It is usually the sequel of some other disease, in consequence of keeping the horse in a debilitated condition, in badly drained and ventilated stables. It rarely occurs where pure air, clean floors, and abundant ventilation are provided.

Symptoms.—Usually the earliest symptom which awakens our suspicion, or which yields indications of the onset of purpura, is the appearance of the local swellings. These swellings are diagnostic; they are sudden in their appearance, occurring in different parts of the body, generally the limbs, the abdomen, or the head, particularly the inferior portion of the face and around the nostrils and mouth. They are sometimes limited or in patches, often uniform when in connection with the limbs, always elevated above the level of the surrounding skin, and terminating abruptly, not gradually by shading off into the level of surrounding parts. They are tense, pitting slightly on pressure, but neither very hot nor very painful.

Very early in the course of the disease, or it may be delayed for some time, the condition of the lining membrane of the nasal cavities is altered. It is at first merely heightened in color, and studded with petechiæ, which gradually extend, chiefly by coalescing, until they cover the greater portion of the septum which is visible, and steadily assume a darker color; or they may be observed to alter in color, as also in extent, with the changes and remissions of the other symptoms. When these blood-spots and submucous blood-extravasations are fairly established in connection with the nasal structures, we observe that a sero-sanguineous fluid, or blood, of a darker color than natural, and not disposed to coagulate, trickles from the nostrils.

From the infiltration of the subcutaneous tissue of the external, and the submucous of the upper and internal air-passages, and consequent

swelling, the breathing becomes embarrassed or accompanied with a troublesome cough.

Treatment.—The first step must be to remove the animal from all offensive smells, bad drainage, and bad ventilation.

Pure air, light, warmth, and comfort are the first essentials. Secondly, it must be borne in mind that the great danger of a suddenly fatal termination is from extravasation into some internal organ, or even into the subcutaneous tissues.

For the purpose of overcoming this tendency to extravasation, astringents, as the tincture of the chloride of iron, are sometimes successfully employed. If these are given in combination with an oleaginous purgative, any astringent effect which they might otherwise exercise on the alimentary canal is prevented.

Tincture of chloride of iron..... ℥ i.
Linseed oil.....1 pint

It must, however, be remembered that extravasations depend more upon the condition of the blood than upon the blood-vessels, and remedies which are calculated, either by their antiseptic or oxidizing properties, to alter the abnormally fluid condition of the blood, are better calculated to attain the object than those which merely act upon an effect of the disease. For this reason, the chlorate of potash has been prescribed, and with marked results.

Chlorate of potassium..... ʒ iij. to ʒ iv.

in food or water three times daily for three days, after which time Robinson advises its use in doses of

Chlorate of potassium..... ʒ ij.
Nitrate of potassium..... ʒ i.

The salts of iron usually employed are the sulphate or solution of the chloride—the former is to be preferred, combined with diluted sulphuric acid—thirty grains of the sulphate with half a fluid drachm of the acid in cold water twice or thrice daily. This may either be given alternately from the commencement of the treatment with the chlorate of potash, or its administration may be deferred for some days, and then

employed in this alternate manner. When benefit does not seem to follow the use of the iron salt in conjunction with the potash compound, when the local swellings do not give evidence of subsidence, the substitution of the oil of turpentine for the former is advisable; the quantities to be administered being from six to ten fluid drachms in combination with linseed oil, good gruel, raw eggs, or a combination of the last two.

In those cases where exhaustion and depression are great, and where sufficient food is not being taken into the system, a steady but moderate stimulation is indicated; this may be accomplished while the administration of the medicines already mentioned is being carried out, and alcoholic are to be preferred to the ammoniacal stimulants.

If the head be much swollen, and there be a difficulty in breathing from tumefaction of the nostrils, continuous cold sponging must be ordered. The sponge may be dipped in cold water or in some weak astringent solution—vinegar and water, or the terchloride of iron tincture, largely diluted; if the cold sponging fails to reduce the swelling, warm may be substituted, particularly if the weather be very cold; but beyond doing this to the head, I am of opinion that all other interference does much mischief.

The swellings are but the result of the condition of the blood, and when the latter is restored to its normal standard, the swellings will disappear. Indeed, an abatement of the swelling in one part of the body is often succeeded by tumefaction in some other, and perhaps more important structure or organ. The swellings are generally metastatic, and when they are confined to those parts of the body where they cannot endanger life, it is far better to leave them alone. They should not be punctured.

SCARLATINA.

Synonym.—Scarlet fever.

Definition.—A febrile disease, characterized by an eruption on the skin, petechial spots on the nose, soreness of the throat, and sometimes suppuration in various parts of the body, particularly in the submaxillary space.

Unlike the scarlatina which attacks the human being, it is a non-contagious disease, generally attacking but one or two horses in a large

stable, amongst which some form of epizootic disease is at the time prevalent.

Etiology.—The causes of scarlatina in the horse are not well understood. It is, however, manifest that those which seem most predisposed to it, have just passed through some other debilitating disease.

Symptoms.—The symptoms indicative of the simple form of scarlatina seldom occur before the end of the first week of the primary fever which it may accompany or succeed, and frequently they are delayed for a longer period. Unaccountable depression, renewal or increase of febrile symptoms—according as the previous fever has intermitted or only remitted—not at all indicated on the previous examination of the animal, with a slightly swollen condition of the eyelids, are most probably the features which solicit a more careful examination. The horse, when caused to move, will show stiffness from the swelling which exists over the limb. On passing the hand over these swellings we may, in certain situations where the skin is thin and vascular, and where the swelling is of a patchy character, detect a certain amount of moisture distributed in a dew-like fashion over the skin; or if this exuded serosity is becoming dry, the sensation imparted to the fingers is similar to what is felt on passing them over a mildly vesicated surface. Very careful examination may detect the vesicles before they rupture and discharge the serous fluid. More carefully examining the face and head, to which we are led by the swollen eyelids, there will in all likelihood be noticed several blotches there and over the region of the throat, which, although they may not feel dry or rough to the touch, are yet to the eye rough-looking, from the open condition of the hair. In many cases there may be very few or no elevated patches on either body or limbs, nothing save some amount of œdema; the only diagnostic symptoms being those connected with the membrane of the mouth and nose. When the elevated, exuding, or roughened cutaneous patches are present, the nasal and oral lesions are rarely absent; these consist of numerous bright-red dots or spots scattered over the membrane both of the nose and mouth. These blood-spots are most readily observed on the membrane covering the nasal septum and on the inner surface of the lips; they are variable in size and form, as also in intensity or depth of color, not only in different cases, but in the same case on different days, or even at different periods of the same day; their size, number, and intensity of color seem to bear a direct relation

to the severity of the fever, and its advance or defervescence. At times there is coalescence of these spots, or a connection of one with another by rays stretching between them. The general appearance of the membrane upon which the punctated blood-markings are situated is not, in the simple form, much changed in color. Many of the circumscribed elevations of the cuticular surface, when of a light color, and denuded of hair, show the petechial markings very distinctly, exactly like those which exist on the nasal and buccal membrane. If the affection to which this scarlatina has succeeded has not been accompanied with soreness of the throat, such will most probably now manifest itself, either accompanying the rash or preceding it. In mild cases the rash and blood spots will disappear in a few days and the horse soon regain his strength.

Treatment.—In the milder forms of the disease it is sufficient to keep the animal in a warm, well-ventilated, light, loose box, to feed it on laxative food, and give small and repeated doses of the nitrate of potassium, hyposulphite of sodium, or chlorate of potassium, in the food or water, say one drachm. The body must be clothed according to the weather, and the general comfort of the animal attended to.

In the graver forms, the animal must be carefully watched, more especially with regard to its breathing, for in some cases the glottis and other structures of the throat rapidly swell, the larynx becomes constricted, and the animal may die from suffocation. Whenever this is threatened, tracheotomy must be performed; and in all cases where the breathing is difficult, and accompanied by a loud roaring noise, this operation is to be resorted to, in order that the animal may obtain pure air to oxidize its already impure blood.

The throat is to be repeatedly bathed with hot water and enveloped in warm poultices, and the animal made to inhale the steam of hot water by use of the nose bag, Fig. 14. The mouth is to be frequently washed out with salt and water, and if the coryza is excessive, some of it may be applied to the nose. If the face and nares are swollen, they must be frequently bathed with cold water, and afterwards dressed with some astringent lotion, such as a solution of the tincture of chloride of iron. If the bowels are very torpid, a gentle laxative may be administered, such as one pint of linseed oil, but active purgation must on no account be induced; the nitrate of potassium may be given freely in the food or water, and abundance allowed of the latter, which must be cold and fresh. If signs of purpura hæmorrhagica supervene, the chlorate of potassium

must be substituted for the nitrate. If much depression is present, draughts of spirits of nitrous ether may be given, provided deglutition is not difficult; but if the act of swallowing causes pain and cough, nothing should be forced upon the animal, or suffocation may ensue. Indeed, where the throat is very sore, even the oil must be withheld, and the bowels relieved by enemas, or by the sulphate of magnesia dissolved in the horse's water. If he will drink this, it has a very good effect, but many horses will not drink at all if salts are dissolved in their water. After the first few days, milk, or milk with eggs, is to be allowed in abundance, in order to support the animal strength. When the secretions are restored to their natural condition, and the soreness of the throoat a little abated, a small ball containing carbonate of ammonia—the ball being well oiled—may be given two or three times a day with great benefit, and later on the mineral tonics, with bark or quinine.

CHAPTER XII.

FLESH WOUNDS.

Incised wounds, Lacerated wounds, Punctured wounds, Contused wounds, Wounds of the abdomen, Frostbite, Burns, Scalds, Poisoned wounds, The Stings of Insects, The Poison of Snakes, Acids and Alkalies.

Definition.—A flesh wound is a solution of continuity in the soft parts, suddenly produced by violence.

Common flesh wounds may be divided into Incised, Lacerated, Punctured, and Contused.

An Incised Wound

is made by some sharp, clean cutting instrument, and there is no tearing or contusion of the parts. If the wound is in line with the muscular fibres, it will not gape much and can easily be kept together. If, however, it is across the muscles, the natural retraction will cause the wound to gape open, and in the recess thus formed blood and pus may collect and retard the healing.

Lacerated Wounds are usually more or less contused also. The skin is broken and torn by the contusion, and its edges are ragged and uneven. Lacerated wounds may be simply an abrasion of the skin, or they may involve deeper structures; the range being from a simple scratch or scrape to the forcible tearing off of the horny part of the foot or a deep cut from falling upon a sharp stone, and its gravity, of course, varies in the same degree. Punctured wounds are produced by the penetration of a sharp or blunt pointed instrument into the tissue, usually to a depth disproportionate to the aperture of entrance. Punctured wounds are the most dangerous of all wounds, and for the reasons that, from their depth, they are liable to implicate arteries, nerves, veins, viscera, and deep-seated

vital parts; that the parts which they traverse are stretched and torn, and consequently are disposed to inflame and suppurate; and pus, when formed, has no free exit, and is liable to burrow extensively; that foreign bodies may be carried to great depth without being suspected, and create long-continued irritation; and finally, punctured wounds are most liable to be followed by tetanus.

Contused Wounds

are injuries inflicted by some blunt object, without perforation of the skin, and its consequences are a degree of concussion or benumbing which may be severe without further mischief, as, for example, when a horse strikes his leg with the opposite foot, goes lame for a time, but very shortly is all right again. This is called *brushing* or *interfering*, and a repetition of it will cause some structural change in the part contused.

The second effect of contusion is a structural injury, varying in degree. There may be rupture of the smaller blood-vessels, and infiltration of the blood into the surrounding tissues, constituting ecchymosis, or a large blood-vessel may be ruptured, and the blood extravasated in considerable quantity, tearing up the areolar tissue in which it congulates; or if an artery be cut, a false or diffused aneurism may be the result.

The third effect may be the formation of a serous abscess.

The fourth effect may be the pulpification, disorganization, and subsequent mortification of the part contused, not merely of its surface, but of structures deeply imbedded beneath the skin. Repeated contusions of the coronet and pastern, by "brushing" or "interfering," are succeeded in the colder months of the year by violent inflammation of the skin and subcutaneous tissues, and the formation of abscesses in the parts, which sometimes endanger the life of the animal by the severity of the accompanying fever; whilst in other cases the inflammation extends into the joints, rendering the case almost hopeless.

Etiology.—Wounds of the flesh are produced by accidents chiefly, and are sometimes very serious.

There is a greater disposition in the horse than in man to suppurative action. Hence wounds of any extent seldom heal completely in the horse by direct union or by adhesion. These modes should, however, be sought for and obtained as far as possible in each case, with the view of reducing the size of the part requiring to be filled up by granulations.

Treatment.—In the general treatment of wounds, attention should first be directed to cleansing the injured parts from all foreign bodies, as far as possible, by allowing lukewarm water to fall in a stream over it from the mouth of a vessel. It is good practice to add to the water one per cent of carbolic acid. Or a wet sponge or piece of fine tow may be pressed on some part above, from whence the water may gently trickle over the wound; but the abraded surface itself should be touched as little as possible. Fig. 1. Any large particles of gravel or dirt may be carefully removed by the forceps. It is, however, a mistake to irritate a wound by over-anxiety to cleanse it thoroughly. Nature will by her own processes remove with less irritation than man can do any foreign matters which may be so imbedded as not to come away by the simple washing recommended.

If there is any hemorrhage, it should be stopped at once, for which purpose, in ordinary cases, the application of cold, styptics, or pressure is generally sufficient. If the blood persists in oozing out and an artery is not involved, the application of persulphate of iron will control it. There is usually very little bleeding in lacerated wounds, sometimes great soreness, and considerable inflammation; this should be treated with fomentations of hot water on them, or form thickness of flannel or a soft bit of rag, or lint, or a mild poultice may be applied with good effect:

Linsed meal.....2 parts
Brewer's yeast.....1 part
Boiling water.....enough

Always have poultices warm when put on. If, however, the hemorrhage be arterial, a ligature or acupressure will probably be necessary; the latter is preferable, as it causes less suppuration.

The best dressing for wounds which comply with the conditions required for direct union is collodion. It effectually excludes the air, and direct union, or at least union by adhesion, is likely to occur. The bandages which retain the dressing should not be removed for some days. The dressing, of course, must not be applied until the bleeding has ceased and the wound has been cleansed. It will be necessary to remove the hair round the part, before the dressing is applied.

For wounds capable of being healed by adhesion, lint steeped in blood or in tincture of benzoin or collodion may be applied. Where collodion is used, the hair about the part must be removed.

For wounds intended to be healed by granulations, there is no better dressing than lint steeped in cold water. Care must be taken to keep the lint moist, and for this purpose it may be covered with oil-silk or thin India-rubber.

All wounds healing by granulations must fill up gradually *from the bottom.* It must be remembered that there is a greater tendency to union in the edges of the skin and in parts near the skin than in the deeper tissues. Hence all deep wounds require to be kept open, until we are assured that the healing process is fully completed from the lowest part. This object may generally be attained by inserting a piece of dry lint between the edges of the wound.

The formation of a slight scab over the exterior of a wound is useful in many cases as a protection against the irritating effects of the air and accidental abrasion; but no dense firm unyielding scab should be permitted to form or remain, because it will unduly check the natural exudation of the matter which in such wounds always forms. The matter, if confined, will collect until at last it bursts out by some large irregular opening, or, if unable to obtain an exit, will burrow in the deep-seated tissues and cause extensive mischief.

If a wound which is healing either by scabbing or by granulations becomes indolent, and the healing process is slow and imperfect, it may be necessary to rouse the parts to more energetic action. If the wound is merely in the skin, the edges of it may be removed with the knife, and the cut surfaces brought into contact and kept together by sutures or sticking plaster. In other cases, caustic may be applied to the wound.

Indolence in the healing process is a sign of constitutional debility. Hence in addition to local measures the general health should be carefully attended to.

In some indolent wounds, and especially in those over the coronet, there is often a disposition to excessive and unhealthy granulations, otherwise called proud flesh. This disposition must be kept in check by the application of some styptic, such as sulphate of copper or zinc, nitrate of silver, or alum, and in some cases, where it can be conveniently applied, by pressure. When granulations form in masses, matter will often be found under them, which is apt to burrow in sinuses, unless an opening be made for it.

In all wounds it is an object of much importance to keep the part in a state of rest. In some parts a certain degree of motion cannot be avoided,

but an endeavor should be made to lessen it as far as possible. For instance, if the jaw be injured, it is desirable to place the patient on sloppy diet which will not require much mastication. In wounds of the leg, advantage may be taken of particular kinds of shoes, such as those raised at the heels or at the toes, according to the circumstances of the particular case. In some cases the patient will require to be tied up to prevent his moving about, while in other cases a cradle will be needed to prevent his gnawing the wound with his teeth.

Sutures are useful in bringing together the edges of the skin in parts where there is but little flesh, such as on the forehead, the nose, and the eyelids; but they do not answer in fleshy parts, because the weight of the flesh and the swelling arising from the attendant inflammation generally bursts them. In such cases, the needful apposition of the parts is best promoted and maintained by bandages. Again sutures are not advisable where the edges of the wound are much torn, or where there are foreign bodies lodged in it, because the inflammation and suppuration which ensue in such cases are aggravated by the confinement of the matter, and in the end the sutures generally break away.

Sutures are best applied by means of a curved needle, Fig. 26. Interrupted sutures answer better than continuous, because the process of healing by direct union or by adhesion is seldom complete in the horse, for reasons already mentioned, and hence the matter which forms needs frequent means of escape. The twisted suture made by two needles and a skein of tow or silk twisted over them, Fig. 32, answers very well in a small incised wound, such as that caused by bleeding in the neck.

In extensive wounds, a flexible silver wire suture is often used in preference to silk, because it does not absorb the effused matters, and hence also is less likely to slough out. In extensive wounds, however, especially in fleshy parts, bandages answer better than sutures.

A bandage should be adjusted very evenly, and not so tight as to obstruct the circulation or to cause pain. When circumstances admit of it, the bandage should be applied above and below, but not over the wound. This arrangement will enable the dressing to be easily changed without the necessity of removing the bandage each time.

True skin, when once destroyed, is never reproduced. Its place is supplied by a cicatrix, which is formed of fibro-cellular tissue covered by epithelium. A cicatrix differs from true skin mainly in not containing sebaceous follicles or hair.

The constitutional effects of such wounds as it is worth our while to treat in the horse are in general not very serious.

Traumatic fever sometimes ensues, but usually subsides in a few days. Temporary debility may follow any excessive loss of blood from an incised wound, but nature soon repairs the loss.

The special treatment called for by incised wounds is, 1, To arrest hemorrhage; 2, To remove foreign bodies; 3, To effect and maintain coadaptation; and 4, To guard against excessive inflammation. (1.) Hemorrhage, whether arterial or venous, is to be arrested, and this is the first thing that must be attended to. If it arises from a small artery partially cut, blood of a bright-red color flows or spurts out in jets; but if it be completely cut across, the ends contract, and the hemorrhage ceases. In some cases the bleeding will continue although the artery be divided completely across, or will take place from time to time, and prove serious. In such instances the end of the artery must be searched for, drawn out by the forceps, and tied by a ligature; occasionally it will be found necessary to enlarge the wound to do this effectually.

Venous bleeding is generally easily arrested by moderate pressure, or by an astringent application, such as a solution of the tincture of terchloride or the persulphate of iron. As a rule, even these slight applications are unnecessary, venous bleeding stopping spontaneously if the wound is exposed to cold air; but if a large vein be wounded, it is often necessary to tie it with a ligature.

When the bleeding is arrested, all clots of blood, dirt, and foreign bodies are to be removed as stated under general treatment.

In wounds where muscular fibres are deeply cut, it is recommended that the wound should remain open for about eight hours, for the purpose of allowing the discharges of blood and serum to escape; or if sutures are immediately employed, they should be applied in such a loose manner as to allow the blood and serosity to escape, and all clots which may afterward form washed out. This is good practice, and insures healing by adhesion in many cases that would otherwise run on to the more tardy process of granulation. In many large wounds sufficient room for the escape of the discharges, which are always profuse for the first few hours, may be obtained by omitting one or even two sutures at the most dependent part of the wound, which, if it be paralled to the axis of the limb and the direction of the muscular fibres, is easily brought together and maintained so by a few sutures, placed about an inch apart. If the

wound be transverse to the direction of the limb or muscular fibres, with a cavity formed by the retraction of the divided muscular fibres, it is difficult to bring its lips into apposition; and when they are coapted by firm and strong sutures, the skin into which they are inserted is almost sure to slough, the process of healing being at the same time retarded by the irritation set up, and the blemish increased to a considerable extent. In such cases the best plan is to bring the lips together at their extremities, using the quilled suture, and leave a gap at the central portion of the wound; or, if the cavity be very deep and in a downward direction, it may be necessary to make a counter-opening as its inferior part, to allow the discharges to escape. If such be the case, the lips of the original wound are to be brought together, and it is possible they may heal by the adhesive process.

The edges of wounds are kept in apposition by means of sutures, pins, plasters, and bandages. Plasters are rarely used in veterinary practice, but their employment, especially in wounds in the lower portions of the extremities, may with advantage be preferred to that of sutures, as they cause no blemish. A longitudinal or even transverse wound situated on a leg is easily brought together by plasters, over which a moderately firm bandage can be applied; and a wound so treated will heal in less time, and leave a smaller blemish, than when sutures are employed.

Various forms of sutures are employed for keeping the edges of wounds together; the *interrupted suture*, Fig. 28, is, however, the form mostly in use, and the material "the metallic suture wire." The wire causes less irritation than thread, and is to be always used in preference.

Contused wounds generally contain serum or a mixture of blood and serum under the skin. Unless very extensive injury is apparent, the application of a stimulating liniment will be serviceable:

Gum camphor..... ... .ʒ i.
Olive oil.....ʒ ij.

Dissolve the camphor in the oil; if a more active action is desired, add to the above:

Oil of turpentine.....ʒ i.

In the progress of any serious contused wound, there are two distinct periods, namely, the separation of the slough produced by the contusion, and that of the repair of the chasm by granulations. If the parts around are much bruised, superficial slough may ensue to a considerable extent. In this case clean the raw surface with castile soap and warm water, to which is added one per cent of carbolic acid. Keep the part clean and covered with healing ointment:

Prepared carbonate of zinc..... ℥ ss.
Lard..... ℥ iij.

Lay a fold or two of soft rags on it to protect it. If the wound does not heal readily, add to this ointment a little turpentine. Before healthy granulations can form, the wound must discharge itself of all dead matter. Minor contused wounds do not generally run to sloughing.

The great principle in the treatment of *contused wounds* is to render them of a simple character by giving to the confined matter and extravasated blood a free exit by making an incision at the lowest part. All contused wounds, however, do not require to be opened, because the effect of the stimulating liniments which may be applied is often sufficient to rouse the blood-vessels and absorbents to remove the effused fluids. In all contused wounds, whether great or small, there is always, it must be remembered, some destruction, though it may be very slight, of the subcutaneous tissues or muscles. The products resulting from such causes must be removed. If the powers of nature are not sufficient, their more speedy removal must be assisted by art.

In *lacerated wounds*, the ragged edges should first be cut away with a pair of scissors, after which the inflammation at first existing in the contused and neighboring parts must be reduced by poulticing before the healing process will commence. For a poultice boiled and mashed turnips are highly recommended, or linseed meal may be used.

For *abraded surfaces*, stypic collodium is an excellent application:

Collodion..... ℥ v.
Carbolic acid..... ℥ ss.
Tannin..... ʒ ij.

For simple abrasions of the cuticle, Kennedy's extract of Pinus canadensis is a very useful astringent and stimulant.

During the healing process, serum is very apt to collect in cavities in the wound. Though punctured, the sacs are apt to fill and refill, and sometimes there is a great deal of trouble in getting rid of them. They are best treated by being freely laid open, and injected with a one per cent solution of carbolic acid.

In the special treatment of *punctured wounds*, if the puncture does not extend into a joint or through the sheath of a tendon, the best plan is to lay open and convert them into ordinary incised wounds. Inject with one per cent solution of carbolic acid.

Unless this course is taken, much pain will ensue, because the deeper tissues, which have been injured and which will become inflamed, have otherwise no room to swell. Again, unless a free opening is made, the matter, which is sure to arise from the inflammatory action, will burrow and form abscesses and sinuses. When this has been done, apply warm fomentations frequently, or, if possible to keep them in place, poultices of boiled turnips or linseed meal are preferable. Subsequently dress the surface of the wound with white lotion:

Sulphate of zinc,
Acetate of lead.....āā ʒ ij.
Water.....1 pint.

If there is good reason to think that the puncture has penetrated a joint or the sheath of a tendon, the case must be treated as one of open joint.

Wounds of the Abdomen,

On account of the structures which they involve, and the danger of intestinal protrusion, require a specialty of management, more particularly when situated in the inferior portion of the abdominal walls.

1st. Shallow punctures, involving the muscles, but not penetrating through the whole thickness of the floor of the belly, are very apt to cause multiple abscesses. The pus formed in the wound, being unable to find exit on account of the smallness of the opening, burrows between the abdominal fascia and muscles, separates them from each other, causing pain and swelling; at the same time small abscesses form in various parts, which are difficult to heal.

2d. Deeper punctures, penetrating almost or completely through the walls, the peritoneum being divided or not as the case may be, are apt to

become enlarged by the pressure of the contained viscera, and to cause death by allowing the protrusion and escape of the intestines.

Treatment.—The treatment for the first form must be conducted with the view to allow the free escape of pus and other discharges, and for this it may be necessary to dilate the external opening. This, however, must be done very carefully, or the second danger may be induced. Very often the burrowing of the discharges is promoted by the drying of the surface of the wound. This is more apt to prove injurious when the hair is long, as the hair and dry discharge become matted together over the opening, which is thus effectually plugged up. Care must be taken that this does not occur, and for its prevention the hair must be clipped round the orifice, and the parts carefully washed and kept clean. If it is necessary to dilate the opening, the incision should be shallow, and along the long axis of the belly. When abscesses form, it is always necessary that they should be opened early, as the fascia, being very tough and elastic, allows extensive infiltrations or burrowing of the pus.

The deeper punctures must be treated with the view to prevent the escape of the intestines. The discharges from them must be allowed free exit; but whilst doing this, their extension by the weight of the viscera must be prevented, and this may be done very effectually by inclosing the body of the patient in a common bed-sheet, sewn firmly round him. This will form a suitable support to the weakened walls, and at the same time allow the escape of the discharges. Should it, however, become clogged up by the coagulation of these, a small hole may be made in it immediately below the wound.

When the peritoneal cavity is actually penetrated, or even when it is only nearly so, the medical treatment should be conducted with a view to lessen the danger of peritonitis. Purgatives are to be withheld, and should the pulse be at all disturbed, opium must be given, and the large bowels unloaded by enemas; fomentations to the belly are to be persevered in until the danger of inflammation is past.

Incised wounds upon the belly are to be treated by strong sutures, the collodion or shellac paste, and the broad-sheet bandage; but fomentations are not to be applied as in punctured wounds, as they would interfere with the adhesive process, unless, indeed, the danger of peritonitis be imminent.

Purgatives should never be administered when the abdomen is

wounded, whether the wound be deep or shallow, as they may excite the most dangerous complications.

Wounds penetrating the walls may heal up externally, but generally a hernia of greater or lesser magnitude remains, forming a permanent blemish.

FROST-BITE.

The first effect of cold is to diminish the vital action of the part to which it is applied. This state of depression, when not continued too long, is succeeded by a more than usual activity, or reaction; and if this alternation be oft repeated, the part becomes permanently weakened, being slightly swelled, of a purple color (as is well shown in horses with white heels), not so warm as usual, and afterward becomes inflamed. The skin will now crack, and a discharge of sanguineous matter take place.

More intense cold not only weakens, but entirely suspends vital action. The part becomes pale, insensible, and shrivelled, and is said to be *frost-bitten*. The skin, particularly the heel, will often slough across from side to side, forming a strip of dead skin, underneath which is a deep chasm, called a cracked heel.

In other instances, and particularly during long-continued snowy weather, with partial thaws, succeeded by sharp frosts, the deeper-seated tissues of the coronet lose their vitality, and deep and extensive sloughs are thrown off, leaving the tendons, ligaments, and even the articulations exposed. The animal now suffers from all the agonizing pain, fever, emaciation, etc., which characterize open joint, and too often succumbs, or has to be destroyed.

Treatment.—Treatment consists in the application of poultices of linseed meal or of boiled turnips, succeeded by cold water and mild astringents, such as:

Sulphate of zinc	ʒ ss.
Water	℥ x.

and finally blisters to the coronet. A good blister for such cases is:

Biniodide of mercury	ʒ i.
Lard	ʒ vi.

A high-heeled shoe upon the foot as soon as the poultices are discontinued may give relief. In the treatment of frost-bites poultices should not be applied for too long a period, for after the slough is thrown off the parts recover more quickly without than with poultices; and, as a general rule, frost-bites are at first best treated with cold applications; but if sloughing has commenced, poultices, irrigations, or fomentations are to be employed, succeeded by cold mild astringents, antiseptics, or deodorizers, such as charcoal.

BURNS AND SCALDS.

These are common at iron works, and result from horses falling on hot dross, the bursting of steam-pipes, etc.

The division of burns is, from time immemorial, into three classes—(1.) Burns producing mere redness; (2.) Those causing vesication; and (3.) Those causing death of the part burnt.

The first class is attended with mere superficial inflammation, terminating with or without—more generally with—desquamation of the cuticle and temporary loss of the hair.

The second class is attended by a higher degree of inflammation, causing the cutis to exude serum, and to form vesicles, followed in most instances by suppuration and the formation of obstinate ulcers. The formation and increase of these vesicles may be often prevented by proper treatment.

The third class of burns is attended with mortification from disorganization of structure; the skin and subcutaneous tissues being literally roasted or broiled, as the case may be, the blood coagulated in its vessels, and the circulation of the part completely stopped.

In all cases of severe scalds or burns there is more or less supervening fever, manifested by shiverings, coldness of the skin and extremities, prostration of strength, restlessness, quick and feeble pulse, and heavy or sighing respiration; the surface of the burnt part, if destroyed, will become pale and leathery, the hair coming off in patches, leaving a denuded surface, from which issues a thin serous discharge. Swelling of the part now appears, and in about four or five days a line of demarcation surrounds the dead part; the chasm widens, the burnt portion contracts and dries, leaving the exposed granulating surface full in view; the granulations

are white, spongy, and moist; there is no discharge of laudable pus, but of a thinnish ichorous matter, generally of a dirty-white color. The slough now falls off, leaving a wound of more or less magnitude, according to the severity of the burn, which takes many months to heal; it then leaves a cicatrix of a hard, dense, cartilaginous nature, which contracts more or less, pulling the surrounding skin into puckered folds, which ever afterward constitute an unsightly blemish.

The most intractable cases are those where the regions of the elbow and shoulder are burnt or scalded. Here, in consequences of the continual action of the parts, and the attrition caused by the motion of the chest against the muscles of the inner part of the arm, the wound never heals. Very often the whole limb is burnt, exposing tendons, muscles, and destroying the tissues protecting the articular cavities; such cases should always be destroyed at once. But if the gluteal region or thick part of the thigh be burnt, involving none of the joints, recovery may ensue, although the injury be excessive.

Horses sometimes die from the first shock; the animal sinks from collapse; the rigors become severe, with great restlessness, feebleness of the pulse, sighing respiration, rapid prostration, and death.

Treatment.—In all the curable cases, Carron oil, namely, linseed oil and lime water, in equal parts, is to be applied frequently. A good plan is to dredge this over with flour, or if the oil and lime water is not to be easily obtained, dredging with flour is a good plan, or apply cloths wet with a saturated solution of bicarbonate of sodium. The Carron oil and flour prevent pain, by excluding the atmosphere; and should neither remedy be at hand, the parts may be protected by cotton wool or anything that will exclude the air. A solution of nitrate of silver, five grains to the ounce of water, to be applied continually, or as often as each application dries, for several hours, is said to be effective. Opium and stimulants are to be administered, and the bowels acted upon by a purgative:

Powdered aloes..... ℥ vi.
Powdered gentian..... ℥ ij.
Linseed meal and molasses.....sufficient
To make one ball.

This should operate in ten or twelve hours. In about four days pus will form. The wound has now to be treated like any other suppurating sore.

If the burn is slight, and the structure of the part merely inflamed, the white lotion is a good application:

Sulphate of zinc,
Acetate of lead.....āā ʒ ij.
Water.....1 pint.

POISONED WOUNDS.

The bites or stings of insects cause a good deal of irritation and pain to animals, but are not of much importance, and seldom come under notice. They should be treated by dilute ammonia, or the following is recommended to allay the itching:

Sulphate of zinc.....gr. x.
Water.....ʒ ij.

Sometimes the eyes become inflamed, and the eyelids swollen and painful from this cause. The best preventive is laurel water, applied to the parts twice a week.

The poison of snakes appears to cause death in two ways; when very strong, by directly destroying the irritability of the nervous system, like some of the most powerful narcotic poisons; when less powerful, by diffuse inflammation of the areolar tissue, abscesses, and gangrene. In the first-named instances the symptoms are extreme depression, and a sinking, feeble, flickering, intermittent pulse, coldness of the extremities, dilated pupils, speedy insensibility, stupor, and death. In the second form, the symptoms are of the most alarming asthenic character, from the moment of the infliction of the bite, and are succeeded, if the patient live sufficiently long, by diffuse suppuration and gangrene. The post-mortem examinations of such cases reveal a dark, alkaline, and fluid state of the blood, which emits a peculiarly sickly odor, intense congestion of the lungs and spleen, with other appearances indicative of "death of the blood" (necræmia).

The local treatment consists in preventing absorption into the circulation by tying a ligature round the bitten limb upon the cardiac side of the wound; the immediate excision of the part, followed by the applica-

tion of cups exhausted of air (cupping); followed by the free use of the actual cautery.

The constitusioual treatment must be directed to combat depression by stimulants—wine, brandy, whiskey, or, according to the latest method practised in India, the injection of ammonia into the veins.

Sometimes the skin and subcutaneous tissues are destroyed by the action of some poisonous substance, such as the mineral or other acids, caustic alkalies, etc. These substances, when used intentionally to remove morbid structures, or when applied to unhealthy wounds, are called caustics. When spilled upon or applied to a large surface, their effects are similar to those of burns; they inflame and afterward destroy the part. If concentrated, they chemically destroy the vitality of the tissues, and results like those supervening on burns are the consequence.

Treatment.—If an acid has been the cause, it is well to wash the parts in some alkaline solution, to neutralize its effect as much as possible, and to destroy any that may be left on the surface. If a caustic alkali has been the cause, a weak acidulated solution is to be used, such as vinegar and water, and the after-treatment must be according to the general principles laid down for the treatment of burns.

CHAPTER XIII.

ULCERS AND FISTULÆ.

Ulcers, Poll-evil, Fistulous Withers, Saddle and Harness Galls.

ULCERS.

Definition.—An ulcer is defined to be a solution of continuity caused by ulceration, and its varieties in Veterinary Surgery may be arranged under six heads. 1*st*. Healthy ulcer; 2*d*. Weak ulcer; 3*d*. Indolent ulcer; 4*th*. Inflamed ulcer; 5*th*. Gangrenous or phagedenic, or sloughing ulcer; 6*th*. Specific ulcer.

1*st*. The healthy ulcer is smooth at its edges, which are neither everted nor inverted, adherent to the granulations, and when they rise to a level with the skin, a film or cicatrix is formed like a semi-transparent ring round the edges, and gradually spreads over the wound. The granulations are small, firm, numerous, and of a fine florid color, pointed at their tops, and discharging a thick laudable pus.

But little treatment is required for this kind of ulcer, beyond rest and cleanliness.

2*d*. The weak ulcer. The granulations are pale, large, flabby, not pointed, but even bulbous at their tops, less vascular, and less apt to bleed on being touched than those of the healthy ulcer; they are unattended with pain, rise above the level of the skin, so that the margins of the ulcer are hid from view. The discharge is thin, pale, and watery.

This kind of ulcer is caused by some debilitating local or general influence. It is often found in the hind legs of low-bred animals, and arises in them from the venous congestion and dropsical effusion, which are so often met with in round-legged cart horses. It is associated per-

haps with some constitutional weakness, arising from bad food, or other cause of general debility. Healthy ulcers, when improperly treated, are apt to degenerate to this form.

The treatment ought to consist of some mild astringent dressing, as the solution of sulphate of zinc or of copper, the periodical use of the nitrate of silver—say, every three days, if thought requisite—and the careful application of a bandage, both to the ulcer and to its neighborhood, in order to stimulate the granulations and to correct the tendency to congestion. The general system is to be corrected by a gentle purgative, succeeded by tonics and diuretics; at the same time the strength is to be kept up by good, nourishing, but easily digestible food, dry food being preferable to moist. The patient ought to have regular exercise, and great attention must be paid to cleanliness.

3*d*. Indolent ulcer, found usually about the coronet of old horses. Its edges are thick, prominent, comparatively insensible, smooth, shining, firm, incompressible, and without any appearance of cicatrix; the surrounding parts are swollen, hard, incompressible, and if the skin be white, discoloration will be seen from congestion of the vessels; the surface of the ulcer is nearly devoid of granulations, smooth, glossy, and whitish, gray, or brown in color; the discharge is thin, watery, and scanty. The treatment of this ulcer is by blister, succeeded by gently stimulating dressings, but bandages do more harm than good. The constitutional treatment must depend upon the condition of the animal, but generally a purgative is useful.

4*th*. Inflamed ulcer. The edges are red or purple, swollen, hot, tense, tender, and painful; the sore presents no granulations, but has a raw, pulpy, foul, and even livid appearance; the discharge is offensive, profuse, mingled with blood and ulcerative *débris;* the pain is great, and there is always some attendant fever. This ulcer may be caused by the presence of some foreign body in the part, which must be removed; it may be a piece of dead tissue, skin, ligament, or bone, as when this ulcer is produced by a tread. Whatever it be, the first step in the treatment must be its removal. This being done, the inflamed ulcer must be converted into a healthy one by means calculated to subdue excessive irritability. The most useful local applications for this purpose are warm fomentations and poultices, combined with opiates; the general treatment to consist of a purgative, succeeded by febrifuges, and the diet to be light, and easy of digestion.

5th. The phagedenic, gangrenous, or sloughing ulcer, which may arise from constitutional debility or from local causes, as frost-bites, is that in which the edges are very irregular, and of a dark purple appearance, extending a considerable way into the surrounding parts; they are often inverted, and exceedingly painful. The surface of the ulcer is uneven, of a dark, livid color, presenting a very irritable appearance and much surrounding swelling. The discharge is thin, ichorous, and mixed with blood. The ulcer enlarges with great rapidity, the destructive process being carried on both by ulceration and sloughing. In some cases many points of ulceration form in the neighborhood of each other, the ulceration taking place around several central sloughs; these by enlargement coalesce, and ultimately form one large ulcer, embracing, as in some cases of "carbuncle of the coronary band," a space of several inches. The treatment of this variety is a matter of great urgency and importance, but not always satisfactory.

Treatment.—Free scarifications of the part, to relieve congestion; the removal of all sources of irritation, and the application of emollient and antiseptic poultices or fomentations, constitute the best local treatment. If the ulceration continues to spread, the gentle application of nitrate of silver to the edges may benefit. The constitutional derangement must be treated by purgatives, anodynes, or sedatives, succeeded by tonics; and the diet regulated according to the stage and variety of the accompanying symptoms.

POLL-EVIL.

Definition.—This is a fistulous ulcer situated on the supero-posterior portion of the cranium immediately behind the ears of the horse, and is caused by accidental violence, or by the habitual use of a tight bearing-rein.

At the first stage it may be recognized as a soft fluctuating tumor surrounded by inflammatory swelling, enlargement of the superior cervical lymphatics, and stiffness of the neck; or the inflammation of the surrounding tissue may have subsided, leaving a prominent swelling—a serous abscess.

From the peculiar position of the injury, the matter has no depending

orifice; and hence it generally happens that, unless artificial assistance by free incision is given for the escape of the matter, it will burrow downwards among and under the ligaments which support the head. Among these it is apt to form large and deep sinuses and fistulæ.

These sinuses often extend down to the bone. The offensive smell of the matter contained in them will indicate this extension. If the matter is suffered to remain long in contact with the bone, it will probably cause caries.

Treatment.—Before pus is formed, reduce the inflammation, if present, by the application of cold water to the part, and by the administration of purgatives internally. When the inflammation is overcome, reduce the swelling by friction with iodine, *but do not puncture;* but if suppuration is established, the abscess cannot be opened too soon, and it is best to make the incision at its base, to allow the pus to escape from its most inferior part. For this purpose, a free incision is to be made, and it must not be allowed to close too soon; fomentations are to be repeatedly applied, but no special application is required, the ordinary treatment for abscess being all that is necessary.

If the abscess has already burst, is discharging a fœtid unhealthy pus and the opening is surrounded with fungous granulations, the disease will be found to have assumed a most formidable aspect; for not only will the subcutaneous areolar and muscular tissues be involved, but the *ligamentum nuchæ* also; which, being tough and elastic, imprisons the pus, causing it to burrow in various directions, and having a low organization, its healing powers are exceedingly torpid. The treatment of a case of this description is a matter of some difficulty, and to be complete, a thorough examination must be made with the probe of all the fistulous ulcers and sinuses. These must be freely laid open to their very base, and the whole dressed with a solution of the bichloride of mercury, the chloride of zinc, or the muriate of antimony; a thin layer of the parts laid open will thus be destroyed, and the whole converted into a common wound. The repeated applications of caustics and escharotics are not required, indeed they do much harm; when once the part is converted into a healthy-looking wound, all that is necessary is to keep it clean, dress with mild astringents, and prevent the opening from closing too quickly.

In many cases, setons inserted from the original opening along the direction of the fistulæ, and brought out upon the opposite side of the poll, are very successful; but if there be many sinuses, the seton

treatment is not to be depended upon, and it is better to use the knife freely.

When poll-evil is caused by the bearing-rein, it is deep-seated, perhaps involving the synovial membrane of the occipito-atloidean articulation, and some cases have terminated in anchylosis of this joint, causing the animal to be permanently stiff-necked. In some instances the ulcerative process has penetrated the capsules of the first or second cervical articulations, causing sudden death by pressure upon the medulla spinalis; in others, pieces of the bones become detached, keeping up the irritation and formation of pus; these must be searched for and carefully removed.

FISTULOUS WITHERS.

Fistulous withers are similar in their nature and require much th same treatment as poll evil. They are nearly always caused by pressure from the saddle, or collar, or by injuries.

In most cases the mischief is at first very slight, and a day or two's abstinence from work with a little alteration of the saddle or collar will



FIG. 137.
Fistulous Withers.

generally effect a cure and prevent recurrence. If the skin is tender, a salt and water dressing may be applied.

When, however, the cause is continued or repeated, the tissues under the skin become inflamed, and the cartilaginous pads of the heads of the spines of the vertebræ may be injured. If such should be the case,

omentations must be applied in the first instance to reduce the inflammation. If these fail, as they often do, in bringing about resolution, matter will probably form under the skin.

Unless a free opening is made for its escape, it will burrow in, under, and among the muscles, tendons, and ligamentous tissues which lie on each side of the spine or withers, and will form sinuses. The treatment in such cases is exactly the same as that of poll evil. Nothing answers better than the seton recommended above.

Caries of the spinous processes of the bones of the vertebræ occasionally supervenes. It will be indicated by the offensive smell proceeding from the sinuses. Unlike the similar occurrence in poll evil, this further development is easily treated; and a radical cure without any injurious result may generally be effected by removing the injured portions of the bone by the pincers. The parts, as a general rule, heal over favorably, and nothing more than a slight hollow will be noticed about the withers.

SADDLE AND HARNESS GALLS.

Though not primarily ulcers, harness galls may easily run into them. Under ordinary use, the skin is sometimes abraded by various parts of the harness. As soon as observed, the harness should be shifted in some way, if possible, so as not to rub on the sore spot. If the skin has not been broken, it may be hardened by rubbing with a saturated solution of salt and water or alum and water. If the skin is broken, Kennedy's Pinus canadensis is a useful astringent, or tincture of myrrh and aloes may be applied, and this is said to have the advantage of keeping flies away from the sore. Or,

Turpentine..... ℥ ss.
Vinegar..... ℥ i.

is useful.

Should a scab be rubbed partly off, trim away the ragged edges and apply any of the above. If the wound is an extensive one and the scab is broken, it will probably be best to poultice it until it all comes away, and hen begin the treatment again to form a new scab.

CHAPTER XIV.

AGE, AS INDICATED BY THE TEETH.

Structural alterations, Back Teeth, or Molars or Grinders, Anterior teeth or Incisors, Distinction between the Temporary and Premanent Incisors, Temporary or Milk Incisors, Development of the Permanent Teeth, The Mark, Parrot Mouth, Bishop-ing, The Fang-hole or Secondary Mark, Further changes indicating the Age, Lateral breadth, Triangularity, Length, Slope, Loss of circularity in form of the jaw, etc., The Tusks, Collateral circumstances to be taken into consideration.

The principal guide to the age of the horse consists in the indications given by the teeth.

The following pages explain the changes which take place, so as to enable the reader to form a correct judgment in regard to age.

Structural alterations take place in the teeth every year from birth up to the sixth year. Hence there can rarely be any question as to the real age of a horse up to that date, though dealers often try to deceive the unwary by various tricks. Such tricks are, however, easily detected.

After the mouth is fully completed, the age can only be *approximately* determined by the effect of wear in altering the shape of the teeth, by the receding of the gums, and by other such signs.

Many circumstances, however, often contribute to modify the effect of wear on the teeth, and also to increase or decrease the action of time in other respects. Hence, after six years old, an approximately correct opinion can only be formed by those who have given to the subject some time, thought, and trouble.

Back teeth, or Molars or Grinders.—The foal is born usually with two, sometimes with three, temporary molars in each jaw. About twelve months old another molar, a permanent tooth, appears, and before the

completion of the second year a fifth molar, also a permanent tooth, shows itself.

About two and a half years old the two anterior temporary molars are replaced by permanent teeth, and between three and four the remaining, or third, temporary molar is similarly replaced; and about the same time the last or sixth permanent molar begins to appear. Thus when the mouth is completed, there are six permanent molars in each jaw, or twenty-four in all.

These structural changes afford a very good index of the age of the horse up to the period when they are completed, namely four years old. The molars, however, are seldom referred to, because their position at the back of the mouth renders their examination inconvenient and often very difficult. Neverless, it is useful to be acquainted with the structural changes of these teeth in cases where there may be a doubt as to the true age, as indicated by the incisors. After four years old, the molars are not often taken into consideration in determining the age of the horse.

A supplementary molar known as a "Wolf's tooth," sometimes appears in either jaw. Such teeth seldom cause any inconvenience. If they do so, they can easily be removed by the pincers, as they are only of a rudimentary character.

The Anterior Teeth, or Incisors, are six in number in each jaw, when the mouth is complete; and in the immediate rear of these in males, there is usually added one very peculiar pointed tooth on each side in each jaw, called a tusk. Though there are two crops of incisors, yet there is but one of tusks. In fact, these teeth, though they begin to appear about four years old, are not usually fully developed until the last permanent incisor is more or less up.

The upper incisors are considerably longer and larger than the lower.

Distinction between Temporary and Permanent Incisors.—Temporary, otherwise called Milk, are easily distinguished from Permanent incisors by the following well-marked signs, namely, they are smaller, whiter, and have more distinct necks. They are smooth externally, and grooved on the inside, probably in order to enable the foal more easily to grip the teats of the dam. Their fangs are small and have but little attachment to the gums. The jaws are plump, fleshy and round, and the teeth are arranged in something like a semicircle.

Permanent teeth, on the other hand, are larger, broader, wider in their necks, grooved externally and smooth internally, and more discol-

ored than milk teeth. The discoloration is due to the lodgment of the juices and other matters connected with the food in the grooves. The object of the external grooving probably is to enable the animal to get a better grip on grass and such-like food. The plumpness and circularity of the jaw is less than in the younger animal, and it gradually decreases, until in old age the teeth are arranged in a nearly straight line.

The Temporary or Milk Incisors.—The foal is born with his teeth in a rudimentary state in the gums. At various periods during the first ten months the different temporary incisors appear. (Figure 138.)



FIG. 138.
Teeth of a Foal.

Under one year old, the foal is also clearly distinguished by a woolly tail.

The yearling is complete in all six incisors, but several well-marked signs distinguish his mouth from that of the two-year old. The teeth at this period show but little signs of wear. The corner teeth are mere



FIG. 139.
Teeth at One Year.

shells, having no inner walls, and all the teeth are in close juxtaposition. (Figure 139.)

At two years old, the inner wall of the corner teeth has grown up level with the outer wall. The centre teeth show considerable signs of

wear, and indeed all the teeth appear somewhat smaller than they did in the yearling. They also stand somewhat wide apart at their necks, on account of the gradual growth of the jaw in width. (Figure 140.)



FIG. 140.
Teeth at Two Years.

Development of the Permanent Teeth.—A few months before three years old, the horse sheds the two centre milk teeth, which are re-



FIG. 141.
Teeth at Three Years.

placed by permanent. Thus the jaw contains at three years old two centre permanent teeth and two milk teeth on each side. (Figure 141.)

A few months before four, the horse sheds the two next milk teeth, which are replaced by permanent. Thus the jaw now contains four permanent and one milk tooth on each side (Figure 142). The appearance of the mouth, when closed, and also the mode in which the teeth meet, are shown in Figure 165. This figure will be presently contrasted with Figure 163, which shows the mode in which the mouth closes, and the teeth meet in extreme old age.

A few months before five, the horse sheds the two remaining milk teeth, which are replaced by permanent. Thus the jaw is now furnished



FIG. 142.

Teeth at Four Years.

with six permanent incisors, but the corner teeth are mere shells, having no internal wall. The absence of this wall distinguishes the five from the six year old mouth (Figure 143).



FIG. 143.

Teeth at Five Years.

A few months before six, the inner wall of the corner teeth has grown up level with the outer wall. (Figure 144).

The mouth is now fully complete in incisors, and no further structural changes take place in them. As a general rule, the upper temporary teeth fall out a little before those in the lower jaw.

Up to six years old, therefore, inasmuch as we have structural changes

to guide us, there can seldom be any doubt as to the age of the animal. There are, however, some well-authenticated instances of abnormal development of the permanent incisors, but they are rare.

High feeding encourages the growth of the teeth in common with the rest of the frame. Hence thorough-breds are somewhat more forward in their mouths than half-bred animals.

The Mark.—Hitherto no notice has been taken of the "Mark," or Infundibulum, not because the marks in the young mouth do not afford some indication of the age; but because fuller and more satisfactory



FIG. 144.
Teeth at Six Years.

evidence up to six years old is afforded by the structural changes detailed above. After six, however, recourse must be had to the indications given by the marks and other slight, but gradual, alterations which take place in the form of the teeth.

The Mark or Infundibulum is a very peculiar hollow extending, when the tooth first comes up, about half an inch down the temporary and rather deeper down the permanent incisors. Figure 151.

Thus in the tooth, as it originally appears, there are four walls of enamel. The remainder of the tooth consists chiefly of dentine, less hard than enamel, and more like ivory. A small quantity of crusta petrosa is also found on the outside.

When an incisor first comes up, the hollow affords lodgment for the *debris* of the food and the juices expressed from it, and therefore soon looks

black. As the tooth wears down, the hollow of course disappears; but the surface of the dentine immediately below the original hollow, being a somewhat soft material, has become stained for some distance down. Thus there still is a black mark. With the further wear of the tooth the stained portion of the dentine wears away, and the "mark" is then said to be out. The mark, as the reader will easily see from this description, is in a constantly changing condition.

Premising that the time, which the mark will take to wear out, will vary to a greater or less degree according to certain circumstances detailed hereafter, the following are general rules for guidance.

Between three and five years old the marks are very plain in all the permanent incisors. Fig. 142 and 143. At six, the marks are wearing out of the two centre teeth, which came up at three years old. They are plain in the two next, and perfectly fresh in the two corner teeth. Fig. 144.

At seven, the marks have disappeared from the centre teeth, are wearing out of the two next, and are distinct and plain only in the corner teeth. Fig. 145.



Fig. 145.

The Mark at Seven Years.

At eight, the marks have disappeared from all but the corner teeth, in which they are becoming indistinct. Fig. 146.

At nine, the marks are not usually found in any of the teeth. Fig. 147.

For about two years after the mark has disappeared in each tooth, there may still be seen in the form of a star a trace of the enamel which lined the bottom of the original hollow, and which underlies it for some depth. This star of course decreases in size with the wear of the teeth. About twelve or thirteen the last traces of the enamel have usually dis-

appeared even from the corner teeth, but it may remain some time longer.

Many casual circumstances, nowever, cause a certain degree of devia-



FIG. 146.
The Mark at Eight Years.

tion from these general rules. The time, which the mark takes to wear out, will vary in different horses according to the hardness or otherwise of the teeth and according to the nature of the food on which the animal



FIG. 147.
The Mark at Nine Years.

is kept. In grass-fed horses the marks usually remain at least a year and sometimes two years longer than in those fed on hard food. Again in parrot-mouthed horses, that is, where the upper overlaps the lower jaw, the marks may remain for many years. (Fig. 148.)

On the other hand, some horses, which have a trick of biting the manger, wear down their teeth very rapidly, and therefore lose their marks very early. Horses fed on salt marshes where the sea sand is washed up among the grass, or on sandy plains or meadows, are affected by the increased friction on the teeth caused by the sand. Occasionally a projecting tooth in the upper jaw may cause unusual friction on the

corresponding tooth of the lower jaw, and so may hasten obliteration of the mark.

Most of these and other causes of irregularity of wear, which might be mentioned, are at once apparent to a careful and accurate observer, and will scarcely prevent his forming a pretty correct opinion of the age.

The upper incisors, as previously stated, are considerably longer and larger than the lower, and the infundibulum is nearly twice as deep. The marks therefore remain longer than in the lower teeth. This is mentioned in passing, lest the reader should be misled, if he should by



FIG. 148.
Parrot Mouth.

chance refer to the indications given by the upper teeth to corroborate or correct any opinion as to age, about which he may be in doubt from the appearance of the lower jaw.

Occasionally the dentine on the side of the infundibulum may become stained and even black, and in such cases something like a double mark may be observed. An instance of this peculiarity is shown in a seven-year old mouth, Figure 149.

The mouth taken as a whole is broader at seven year old than at any other period. After this it gradually narrows with age. In this respect General Fitzwygram says the drawings, taken as a consecutive series, are in some degree at fault, as he found it impossible get mouths of the re-

quired ages to a form a perfect ideal series. For instance the mouth represented in Fig. 160 (extreme age) obviously has belonged to a very different animal to that shown in the preceding figure. Again Figs. 160 and 161 are fair specimens, though very diverse, of what may be expected in extreme age in various cases.

Bishop-ing.—Marks on the incisors are occasionally, though rarely,



FIG. 149.

Double Mark at Seven Years.

stimulated by means of caustic or the hot iron by low dealers with the view of deceiving the unwary.

The fraud is readily detected, because, though it is easy to make a black mark on the crowns of the teeth, yet it is impossible to restore the wall of pearly enamel, which, as explained above, surrounds the natural mark or infundibulum. Fig. 150.



FIG. 150.

Real and Simulated Mark.

The Fang-hole or Secondary Mark.—About nine years old, in consequence of the wearing down of the teeth, a slight trace of the fang-hole usually appears in the centre teeth, and somewhat later in the other teeth. It is indicated by a slight discoloration of the tooth at the above point. There is, however, no actual hole, because with advancing years the upper part of the original cavity has become filled up with a sort of spurious dentine, which is more yellow than the true material, of which the

body of the tooth consists. As age increases, this indication of the fang



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FIG. 151.
Tooth Showing Mark and Fang-Hole.

hole, which is sometimes called the "Secondary mark" becomes rather more plain. It, however, affords no reliable data by which to judge of the age, and is only mentioned in this place, lest the reader should mistake it for the remains of the infundibulum. The enamel, it will be remembered, is pearly white, whilst the mark of the fang-hole is brownish-yellow. The position of the fang-hole, marked B, is shown in Figure 151.

Further Changes indicating the Age.—It will be seen, that about nine the "marks" entirely fail us, and indeed after seven or eight they can hardly be said to afford any very reliable data.

From eight years old and upwards the best indications of the age are given by the gradual alterations which take place in the shape of the teeth from wear and in closing of the mouth.

Lateral breadth, etc.—The teeth originally are *broad laterally* at their upper surfaces, otherwise called their crowns or "tables," and thin from front to rear. Figs. 142, 143, and 144. They narrow gradually towards their necks and fangs. Hence, as their upper surfaces wear off, the teeth become narrower year by year. In very old horses there is often a positive interval between the teeth, Figures 160 and 161 and they appear like sticks in the jaw.



FIG. 152.
Changes in the Crown of the Teeth.

The gradual effect of wear in producing this alteration is shown in Figure 152 where successive portions of the upper surface of the tooth are represented as having been removed by the saw. The original form of the tooth is shown in Fig. 153.



FIG. 153.
Original Form of a Tooth.

The amount of wear on the upper surface of the teeth is greater in the young mouth than it is afterwards, because in youth the teeth meet more fairly than they do in after years. Compare Fig. 165 and Fig. 163. The rate of wear gradually decreases, as years increase, because the teeth do not meet so directly, but on the contrary project more and more forward in something like two parallel lines. For example a quarter of an inch will usually be worn off the surface between five and six years old, whilst, probably not more than that quantity will be worn off between twenty and twenty-five years old.

Triangularity.—A further very well-marked indication of increasing age is given by increasing depth from front to rear in the upper surfaces or crowns of the teeth. This increase of depth will be noticed if Figs. 145 and 146 are carefully compared with Figs. 142, 143, and 144. Further wear causes the crowns of the teeth to assume a triangular form. The cause of this will be clearly seen on reference to Fig. 152. The teeth, though they diminish in lateral breadth, increase in thickness from front to rear all the way from the crown to the fang. Figs. 152 and 153.

At six and up to eight years old, the teeth are all broad laterally at their upper surfaces. Figs. 144, 145, and 146. Up to this time the exact year, as the reader will recollect, is pretty well known by the "marks."

At nine, when the marks fail, the alterations in the crown surface or table come to our aid. The two centre teeth, which came up at three, become somewhat triangular. Fig. 147. At ten, the two next teeth show similar signs. Fig. 154. At eleven, the corner teeth have become some-



FIG. 154.
Teeth assuming triangular shape at ten years.

what triangular. Fig. 155. At twelve, the triangularity has increased in



FIG. 155.
Triangular shape of teeth at eleven years.

all the teeth. Fig. 156. This alteration continues to increase in all the



FIG. 156.
Triangular shape of teeth at twelve years.

teeth, until in very old horses the depth from front to rear exceeds the lateral width of the teeth. Figure 157 shows an average mouth of sixteen years old. Figure 158 represents the appearance at twenty. Figure 159 shows twenty-four; whilst Figs. 160 and 161 may serve as specimens of the teeth in extreme age.

Length.—Again, as age increases, the teeth, notwithstanding they



FIG. 157.
Triangular shape of teeth at sixteen years.

really wear down, become apparently longer. This effect is due to the fleshy parts of the gums receding faster than the teeth wear down. In



FIG. 158.
Triangular shape of teeth at twenty years.

extreme age, however, when the gums have receded as far as they can,



FIG. 159.
Triangular shape of teeth at twenty-four years.

the effect of wear causes the teeth to become *visibly* as well as *really* shorter.



FIG. 160.
Shape of tooth crowns in old age.

Slope.—An alteration also takes place in the position or "slope" of the teeth, as regards their closing. This is due to the effects of wear. The



FIG. 161.
Shape of tooth crowns in extreme old age.

original form of the tooth is shown in Fig. 153. Its upper portion, it will



FIG. 162.
Slope of the teeth in extreme old age.



FIG. 163.
Closing of the mouth in extreme old age.

be seen, is nearly perpendicular, whilst the lower part lies in a more horizontal position. Hence in youth the teeth meet directly, whilst



FIG. 164.
Slope of Teeth at Two Years.



FIG. 165.
Slope of Teeth at Six Years.

in extreme age they can scarcely be said to meet at all. Their stumps project forward in two almost parallel lines. (Figs. 162 and 163.)

The various changes which take place in the position of the teeth in reference to their position or "slope" are shown in Figs. 162 to 167. At two years old (Fig. 164) the gums are full, fleshy and prominent, and the teeth are nearly perpendicular. The gradual changes which take place in the slope with increasing years are shown perhaps more clearly in the engravings than could be explained in words.

Up to twelve years old, there can scarcely be much difficulty in forming a pretty correct judgment as to the age. After that time it requires more time, practice and opportunity than most people have at disposal or care to take to obtain the requisite knowledge.

It would probably scarcely interest one not a professional veterinarian, to trace very minutely the changes which take place after twelve years old. Suffice it to say, that the gums continue year by year to recede, the teeth become *apparently* longer and longer and *really* narrower, and consequently the intervals between them increase, and they project forward more and more in a straight line.



FIG. 166.
Slope of Teeth at Twelve Years.



FIG. 167.
Slope of Teeth at Eighteen Years.

About twenty or twenty-two, and in some instances a good de sooner, the teeth, which up to this period have *apparently* increased in length, begin to grow *visibly* shorter, because the gums are so far absorbed that they can recede no further. Hence all further wear shows its effects by diminishing the length of the teeth.

Loss of Circularity.—In the very young horse the teeth are arranged almost in the form of a semicircle. Year by year this form decreases, until in old horses the teeth are arranged in something like a straight line. Compare Figs. 138, 139, 140, 141, and 142 with Figs. 158, 159, 160, and 161.

These drawings of the teeth have all been made from nature; and hence, although pretty normal specimens have been selected, yet in various ways they present in some instances irregularities and deviations from

a positively regular rule of wear. Perfect regularity in wear and in the effect of wear is seldom found in nature. In some instances it will be observed that the enamel is higher and more prominent than in others. This difference does not indicate or in any degree depend on age, but simply on the comparative hardness or softness of the enamel and dentine.

The Tusks.—In horses, as distinguished from mares, great assistance in determining the age is derived from the presence of the Tusks, which are generally wanting in the latter. The tusks usually begin to appear in a very slight degree about three and a half or four years old. Their sharp points then just pierce the gums, and they continue to grow until fully developed about five or five and a half years old. They do not meet like other teeth, and therefere do not suffer from wear from that cause. They suffer, however, from wear in the course of mastication, and in fact undergo greater changes than any other teeth, and so form a valuable guide as to age.

The tusk is a very peculiar shaped elongated tooth. Internally it consists of dentine, and is protected on the outside only by enamel. The enamel, however, overlaps the dentine, and hence arises the sharp edge or hook of the newly developed tusk, which may be felt if the finger be brought round it from behind.

This sharpness gradually wears off. After seven it has disappeared, and in each succeeding year the tusk becomes not only rounder and blunter, but its upper portion wears off. It also appears yellow, on account of the dentine becoming exposed by reason of the enamel wearing off its exterior surface. The tusks, unlike other teeth, do not apparently increase in length with years, but become shorter and shorter. In fact the effect of wear is greater on them than on other teeth, and it is also greater than the process of the receding of the gum. In very old horses the tusk is very little above the level of the gum. Mares sometimes have four small rudimentary tusks.

The alterations, which gradually take place in the form of the tusks, are shown in Figure 168.

Collateral circumstances be taken into consideration.—In judging of the age of the horse by the teeth, every collateral circumstance requires to be taken into consideration, such as the form of the mouth, the way in which the teeth meet and close on each other, the food on which the animal has been kept, any irregularity in the upper teeth which

may cause increased or diminished wear on the lower teeth, and also the habits of the horse in the stable. The teeth of animals which bite at the rack or manger whilst being cleaned, and horses addicted to "crib-biting" invariably present appearances of wear beyond their real age.

As the horse becomes old, the fulness of the chin under the mouth disappears. The inferior margin of the branches of the bone of the lower jaw also become thin. Lastly, the general appearance of the aged horse is much influenced by the work he has done and the treatment he has received.

Age must not be judged by any one sign, but by a mean judiciously



FIG. 168.
The Alterations in the Tusks at Different Ages.

struck between all the signs, and by a careful consideration of all collateral circumstances. It never happens that all the signs combine together to deceive a careful and well-informed observer.

From these pages the reader will perceive that after six years old, *i.e.*, after the structural changes in the mouth are completed, it is impossible to lay down any one single definite rule by which the age can be ascertained. Still, with a little trouble and attention there is no real difficulty in acquiring a knowledge of the horse's age up to a comparatively late period of his life.

Such a knowledge is always valuable to an intending purchaser. Horses of eight or nine years old are still in their prime; but from want of knowledge of the means of ascertaining the real age and from very natural distrust of what the owner may tell them, the public are very shy of buying such horses; and consequently they may generally be obtained at prices below their real value.

CHAPTER XV.

POSOLOGICAL TABLE FOR THE HORSE.

WITH THE ACTION OF THE MEDICINAL SUBSTANCES.

(From Morton's Veterinary Pharmacy.)

AGENT.	ACTION.		DOSE.
	INTERNALLY.	EXTERNALLY.	
Acaciæ gummi	Demulcent.....	....	Ad lib.
Acid. aceticum....	Astringent	{ Antiseptic.... } { Rubefacient... }	...
" arseniosum..	Tonic	Caustic	Grs. v. to x.
" carbolic....	....	{ Caustic and... } { Antiseptic.... }	....
" hydrochloric	{ Lithontriptic.. } { Tonic ..... }	{ Antiseptic.... } { Caustic..... }	f. ʒ ij. to ʒ iv.
hydrocy. dil.	Sedative.....	Sedative	ʒ ss. to ʒ i.
nitricum....	Tonic.....	Caustic	ʒ i. to ʒ ij.
" sulphuric....	"	"	ʒ i. to ʒ ij.
Aconite tinct.....	Sedative.....	Sedative	♏x. to ♏xx.
" extract. ..	Do.	....	Grs. xv. to xx.
Adeps	....	Emollient.....	....
Aloes extract.....	{ Alterative .... } { Nauseant ..... } { Purgative..... }	Traumatic.....	ʒ i. to ʒ ij.
		....	ʒ iv. to ʒ viij.
Alumen	Astringent	Astringent	ʒ ij. to ʒ iv.
" ustum	....	Erodent.	....
Ammoniæ hydroch	Deobstruent	Discutient.....	ʒ i. to ʒ ij.
" liquor..	{ Stimulant.... } { Antacid ..... }	Stimulant.....	f. ℥ ss. to f. ℥ i.
" liq. acet	Diaphoretic.....	Discutient	f. ℥ iv. to f. ℥ viij.
" sesqui-carb.	Stimulant..	....	ʒ ij. to ʒ iv.
Ammoniæ spirit arom.	{ Stimulant.... } { Antacid..... }	....	f. ℥ ss. to f. ℥ i.
Anthemides flores..	Tonic	....	ʒ ij. to ʒ iv.
Antim. potass. tart.	{ Nauseant..... } { Diaphoretic .. }	Irritant.....	ʒ ss. to ʒ i.

AGENT.	ACTION.		DOSE.
	INTERNALLY.	EXTERNALLY.	
Antim. terchlorid ..	Caustic	....	....
" tersulph....	....	Alterative	ʒ ij. to ʒ ss.
Argenti nitras	....	Caustic	....
Arnica.....	Stimulant	Resolvent	ʒ ss. to ʒ i.
Arsenic iodide.....	Alterative.... / Tonic	....	Gr. v. to gr. xx.
Æther sulphuricus	Antispasmodic ...	Refrigerant	f. ʒ iv. to f. ʒ vi.
Barii nitras.....	Alterative.... / Tonic.....	....	ʒ ss. to ʒ i.
Belladon. extract..	Narcotic	Sedative	ʒ i. to ʒ ij.
Borax	....	Detergent.....	....
Calx chlorinata....	Antiseptic.....	Antiseptic.....	ʒ ij. to ʒ iv.
Camphora.	Narcotic.....	Discutient.....	ʒ i. to ʒ ij.
Cantharis.....	Stimulant .... / Diuretic.....	Vesicant.....	Gr. v. to gr. x.
Capsici baccæ. ...	Carminative.....	Rubefacient	Gr. x. to gr. xx.
Carui semina.....	Do.	....	ʒ ss. to ʒ i.
Cascar. cortex.....	Tonic.....	....	ʒ ij. to ʒ iv.
Catechu ext.....	Astringent.....	....	ʒ i. to ʒ ij.
Chloroform.....	Anæsthetic.....	....	ʒ i. to ʒ ij.
Colchicum.....	Diuretic..... / Diaphoretic .. / Laxative.....	....	ʒ i. to ʒ ij.
Collodion	....	Adhesive	....
Copaiba.....	Diuretic	....	ʒ ss. to ʒ i.
Creasoton	Antiseptic.... / Tonic	Caustic..... / Antiseptic....	f. ʒ ss. to f. ʒ i.
Creta prepar	Antacid	Absorbent.....	ʒ ij. to ʒ iv.
Croton semina	Purgative	....	Gr. xij. to gr. xxiv.
" oleum	Do.	Irritant	Gtt. xx. to gtt. xxx.
" farina.....	Do.	....	Gr. xx. to gr. xl.
Cupri ammo. sulph	Tonic	Erodent..... / Detergent	ʒ i. to ʒ ij.
" diacetas.....	Do.	....	ʒ i. to ʒ ij.
" diniodidum..	Alterative... / Tonic.....	Detergent	ʒ i. to ʒ ij.
" sulphas	Astringent.... / Tonic.....	Erodent..... / Excitant	ʒ i. to ʒ ij.
Digitalis	Narcotic ..... / Diuretic.....	....	Gr. x. to gr. xxx.
Ferri chlorid	Astringent	....	ʒ i. to ʒ ij.
" iodidum.....	Alterative... / Tonic...	Styptic	ʒ i. to ʒ ij.
" sulphas	Astringent.. / Tonic	....	ʒ ss. to ʒ i.
Gallæ.	Astringent	....	ʒ ij. to ʒ iv.
Gentianæ rad.....	Tonic	Astringent	ʒ ij. to ʒ iv.
" tinctura.	Do.	....	ʒ ij. to ʒ iv.
Glycerin.....	Nutrient..... ...	....	f. ʒ ss. to f. ʒ i.
Helleborus nig	....	Emollient	ʒ iv. to ʒ vi.
Hydrarg. am. chlor	....	Excitant	....
" bichlorid	Alterative	Detergent	....
" chlorid. .	Alterative ..... / Cathartic.....	Caustic	Gr. v. to gr. x.
" biniodid .	....	... .	Gr. x. to gr. xx.
" nitratis..	....	Stimulant .... / Detergent	ʒ ss. to ʒ ij.
" oxydum.	Alterative.....	Detergent	...
" ox. nitric	....	....	ʒ i. to ʒ iss.
		Erodent	

AGENT.	ACTION.		DOSE.
	INTERNALLY.	EXTERNALLY.	
Hyoscyami ext....	Narcotic, Anodyne	Sedative	ʒ i. to ʒ ij.
" tinct. eth	Do.	....	℥ i. to ℥ ij.
Iodinium	Glandular, Excitant	Glandular, Excitant	Gr. v. to gr. x.
Lini semina	Demulcent	...	Ad lib.
" oleum	Laxative	Emollient	O.ss. to O.i.
Magnesia	Antacid	....	℥ ss. to ℥ i.
Magnesiæ sulph....	Laxative, Diuretic (?)	....	Lb. ss. to lb. i.
Matico	....	Styptic	....
Morrhua oleum....	Alterative	....	O.ss. to. O.i.
Myrrha	Antiseptic, Tonic	Traumatic	ʒ ij. to ʒ iv.
Oleum laurini	...	Stimulant	....
" olivæ	Demulcent, Laxative	Emollient	O.i. to O.iss.
" palmæ	....	Do.	....
" rapi	...	Emollient	....
Opium, Opii tinctura	Narcotic, Antispasmodic	Anodyne	ʒ i. to ʒ ij. f. ℥ ss. to f. ℥ ij.
Petroleum	Stimulant	Stimulant	℥ ij. to ℥ iv.
Pimenta baccæ	Stimulant, Tonic	....	ʒ ij. to ʒ iv.
Pix abietina	....	Rubefacient	....
" liquida	....	Do.	....
" nigra	....	Do.	....
Plumbi acetas	Sedative, Astringent	Sedative	ʒ i. to ʒ ij.
" subacetas	....	Do.	....
Potassa	....	Caustic	....
Potassæ carbonas	Antacid, Diuretic	....	ʒ ij. to ʒ iv.
" chloras	Stimulant?	....	ʒ i. to ʒ ij.
" nitras	Febrifuge, Diuretic	Refrigerant, Antiseptic	ʒ ij. to ʒ iv.
Potassii iodidum	Glandular, Excitant	Glandular, Excitant	℈ i. to ʒ ss.
" sulphuret.	Diaphoretic	Detergent	ʒ ss. to ʒ i.
Quinæ disulphas	Tonic	....	ʒ ss. to ʒ i.
Resina	Diuretic	Calefacient	ʒ ss. to ʒ i.
Sabina	....	Irritant	....
Sapo	Antacid, Diuretic	Stimulant	℥ ss. to ℥ ij.
Secale cornutum	Parturient	....	ʒ ij. to ʒ iv.
Sodæ carbonas	Antacid, Diuretic	....	ʒ ij. to ʒ iv.
" chlorinat. liq.	Antiseptic	Antiseptic	f. ℥ ss. to f. ℥ ij.
" sulphas	Diuretic?	....	Lb. ss. to lb. i.
" sulphit	Antiseptic	....	℥ ij. to ℥ iij.
Sodii chloridum	Tonic, Alterative	Stimulant	℥ i. to ℥ iv.
Spirit etheris nit.	Antispasmo'ic, Diuretic, Diaphoretic	....	f. ℥ i. to f. ℥ ij.
" rectificatus	Stimulant, Antispasmo'ic	Refrigerant	f. ℥ i. to f. ℥ ij.
Strychnia	Stimulant to motor nerves		Gr. i. to gr. iij.

AGENT.	ACTION.		DOSE.
	INTERNALLY.	EXTERNALLY.	
Sulphur	Laxative..... / Alterative	Detergent	ʒ i. to ʒ iv.
Sulphuris iodidum.	Alterative	Do.	ʒ ss. to ʒ i.
Terebinthinæ vulg.	Diuretic	Digestive.....	ʒ ss. to ʒ i.
" oleum	Diuretic..... / Antispasmo'ic / Carthartic....	Irritant ..... / Digestive.....	f. ʒ ij. to f. ʒ iv. / f. ʒ iij. to f. ʒ vi. / O.ss. to O.i.
Veratrum album ..	Nauseant..... / Stimulant.....	Irritant.....	Gr. xx. to gr. xxx.
Zinci acetas..	....	Astringent	....
" carbonas	....	Do.	....
" chloridum..	....	Caustic ..... / Antiseptic ...	....
" oxydum.....	....	Astringent.....	....
" sulphas.....	Astringent ... / Tonic	Erodent ..... / Astringent....	ʒ i. to ʒ ij.
Zingiberis radix....	Carminative.....	....	ʒ i. to ʒ iv.
" tinct. .	Carminative.. / Antispasmo'ic	....	f. ʒ i. to f. ʒ ij.

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